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ILLUSTRATION.

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Art and Industry: Mr. Gladstone's Address at Greenwich.

MOST of our readers will have noticed the interesting and thoughtful address delivered by Mr. Gladstone last week at Greenwich, on the occasion of distributing the prizes to the successful students in the Science and Art classes in that borough. The address has been fully reported in the daily papers, but we propose here to reproduce some of its salient points; not so much in the way of reporting, as on account of comments and considerations which they suggest, both in the way of enforcement, and also perhaps, to some extent, of criticism.

The fact that the prizes were given for attainments of two kinds,—that the classes are grouped as "Science and Art" classes,—seems to have furnished the keynote of Mr. Gladstone's address, which turns not so much on "Art" in its more imaginative and distinctly intellectual range, as on the union of beauty with other qualities in work of an industrial nature. On the whole, we welcome such a tone and tendency in an address of this kind, as touching upon a view of art which has not received sufficient thought, and as being certainly of more practical value than the very vague generalities constantly indulged in by speakers on such occasions. Perhaps we must not, however, charge this entirely to the critical choice so much as to the general recent tendencies of the speaker in question, who has certainly shown a leaning during the latter part of his career towards considering everything from an economical point of view. It is a little too much in keeping with this that one of his first remarks was upon the commercial value of art. Beauty, he urged, as (in one sense) we have often done, so far from being opposed to utility, was a great element in it, "not according to the laws of any particular or abstract thought, but according to that law which is of all others, perhaps, the most generally understood,—the law, as it is sometimes called, of £. s. D." This was exemplified in the case of one great country, France, the trade of which was mainly founded on the beauty of what it produces. Not that the French are not a most ingenious and economical people in the application of means to ends; "still, upon the whole," says Mr. Gladstone, "I venture to give a confident opinion that the high position which France holds in the markets of the world is mainly and essentially due to the fact that from long culture and traditional application of the national mind they combine beauty with utility in the production of such objects as result from the industry of man." Now, we regret to find that remark nearly at the outset of the address, because it is, in a double sense, fallacious. In the first place, a great deal of the French art work, in *bijouterie* and other ornamental productions, which is so much sought after, is by no means in good taste, and can only be called beautiful in a somewhat vulgar sense; and secondly (and more seriously) it is a false view to hold up that the value of artistic work done by a nation is to be judged by the fact that other nations are willing to buy it of them: although, of course, the fact may be used as an inducement to the pursuit of art. The value of such things is independent of commerce altogether,—it is part of the infusion of beauty, and consequently happiness or interest, into men's lives; and the real value of it is the same, to those who can produce it, as if there were no sale for it; and a people who have taken to producing such works mainly with a commercial object have probably already parted with, or have not found, the secret of real beauty.

Passing to the subject more immediately in hand, and after dragging in certain religious reflections, somewhat inconsequentially, if we may be pardoned for saying so,—certainly their relation to the context was incomprehensible,—Mr. Gladstone remarked on the proportion in the number of students in the Science and Art Classes of the Education Department, respectively. It appears that the number of science students is exactly double that of the art students; 48,000 and 24,000 are the figures though an 8,000 may be added to the latter number by counting in the students in evening classes where drawing is taught. It is useful to consider statistics of this kind, as they afford about the best gauge of the amount of interest in the two classes of subject. This is no doubt in reality a scientific age, though the interest in art has much extended among the middle classes lately, in great measure owing to the institution of the Government schools. Still the remark which the speaker founded upon this, that beauty of production is regarded in this country as little allied to usefulness of production, and rather as a luxury reserved for the rich alone, is unquestionably true in the main. Some further remarks which Mr. Gladstone based upon this reflection we have pleasure in quoting *in extenso*:—

"Let me remind you that there have been nations in the world who have made artistic and beautiful forms part of their everyday thought and life. The ancient Greeks offer a grand example of culture and of skill to us, as they have to every nation for the last 2,000 years and more. No matter what it is, you find nothing of Greek production which is not beautiful. It is not merely the *alto relievos* or the *bas relievos*, but common things, many of which must have been produced, not by artists, but by common workmen; and upon every one of these, though with great difference of degree, there is a seal and stamp of beauty, showing that the Greeks endeavoured to work all things into beautiful forms, so that artistic skill and love of the beautiful became an inheritance to them, formed part of their nature, accompanied their daily life, and entered into every kind of production. The ideal of beauty has never been so completely realised in more modern days, though the Italians undoubtedly afforded a very near approximation to it. When I refer to these examples, remarkable and rare as they are in the history of the human race, I expect to be met with the objection that we must not aspire to follow such elevated precedents. On the contrary, I believe the simple truth to be that we must be always aspiring to the highest and the best. If you do so, you may not be able to attain the summit, but you will get nearer to it than if in the first instance, with clipped wings, you are content with moderate aims. I do not wish to use the language of exaggeration, and, on the other hand, I do not desire to fall into the error of depreciating the time in which we live. I do not think a more interesting time than the present has been given to mankind for many generations. Still it is best to be truthful with ourselves, and, if we err, to err on the side of depreciation rather than of inflated conceit and presumption. Now, I may be wrong, but I fear that, owing to whatever cause, there has been a great decline in the genuine sense and appreciation of beauty among us. Those who study the ancient work of Englishmen in various branches of industry will find that a more deep and real and lively conception of form and beauty, and a more ardent and disinterested pursuit of it, as well as of knowledge, characterised the men upon whom we sometimes look back with unwarrantable contempt, than we can flatter ourselves as belonging to us. I hold in my hand a print which few of you can see well, but it represents a work some 25 ft. or 30 ft. in breadth, and is full of beautiful details, which seem to rival the hand of the jeweller. What is this work? It is a screen in a church—not a metropolitan cathedral, not a handsome edifice, upon the erection of which has been lavished the wealth of kings, of nobles, or of the great prelates of the Middle Ages. It is a screen in a church at a place called Llangwm, an obscure church in an obscure town in Monmouthshire, between Usk and Chepstow. I never heard of the church until I heard of it in connexion with this work, nor, I dare say, did any of you. But my point is that this work, in this obscure church, beautiful in its details, its execution, its conception, must evidently have been the work of some village artist at a period when there were no appliances, no Government schools, when there was no notoriety, no excitement when a man did anything—nothing but a love of beauty in the minds and hearts of our countrymen to lead them to execute such work."

We must be pardoned if we are sceptical as to the "village carpenter," whom we meet with very frequently, it is true, in contemporary writing about Mediæval art, but whom we suspect to be nearly as mythical a personage as the "inspired working man" of the present era. Works of the kind referred to, found in obscure places, may have been brought from or originally made for some less humble site; or skilled workmen may have been specially brought to make them; or what is now an out-of-the-way village may have been under very different conditions three or four centuries ago. All of these hypotheses are possible, and any one of them is more probable than that a work of the best class should have been produced by such a person as would in the present day be

spoken of as a "village carpenter." The patent fact, however, that good and beautiful architectural work was the rule, perhaps with scarcely an exception, at the time referred to, is made more of a phenomenon than it really need be considered, by the utter forgetfulness of the fact that in the Mediæval period the gates of beauty and of knowledge were open in hardly any other direction, and the best æsthetic feeling and ability of the day was concentrated on work of this class. We quite concur with Mr. Gladstone in not depreciating the present day; in thinking it, as he says, a "most interesting time." But the best mind of the day is not at present turned in the direction of art, and it is hardly possible to compel it in that direction in any artificial manner. All that is really possible is to give greater opportunity and encouragement for the production of work which aims at being the very highest and best of its kind—that is to say, at combining beauty with utility. And how is this to be done? There has been no lack of receipts and recommendations for the encouragement of art already; some of these have borne fruit to a certain extent. Mr. Gladstone offers another suggestion, which our readers will know we think certainly worth consideration. We will give his own words:—

"We may assume that this is a time when all who feel concerned in the welfare of the country feel it to be desirable that efforts should be made to give instruction in science so as to improve the knowledge of the British artist and workman, and enable him to hold his position in the markets of the world. I beg those who hear me to beware of imagining for a moment that this result can be attained through any other agency in the main than that of the individual mind and will. All that others can do is to offer assistance, and who should offer that assistance? I do not know what you will think of what I am about to say. It may be a foolish fancy of mine, and often those fancies which one thinks one's best are foolish. I confess, however, that I should like to see a great deal of this work done by the London Companies. I hope that opinion does not shock any one. I have not been consulted by the London Companies, but, if so, I would have besought and entreated them to consider whether it was not in their power to make themselves that which certainly they are not now,—illustrious in the country, by endeavouring resolutely and boldly to fulfil the purpose for which they were founded. What was the object for which those Companies are founded? Do you suppose they were founded for the purpose of having dinners once a year, once a quarter, or once a month? Do you suppose they were founded for the purpose of dealing out little sums of money to certain applicants and then having it recorded of them how much good they had done? Nothing of the kind. Eleemosynary works are noble works,—among the noblest, indeed, given to men. But to be an eleemosynary work it must be the work of an individual, and not of a company. These companies were founded for the purpose of developing the crafts, trades, or 'mysteries,' as they were called. They were founded for the purpose of doing the very thing which the Government of the country, out of the taxes of the country, is now called upon to do,—namely, applying their energies and intelligence to secure the great object which I described at the outset to be the application of human labour to all the purposes of industry in the most economical, effective, and beautiful manner."

The London Companies seem to be invited to the front just at present. It is but a few days since the Astronomer Royal, on a public occasion, credited his first formal honour to one of these bodies, and now the *rôle* of "patrons of art" is proposed to them. Will they accept it? The position would really be a perfectly suitable one, and bear some analogy to that assumed by the trade guilds of the Mediæval time. That such a part would be more in accordance with the objects for which they were originally instituted than the conventional dinner-giving is absolutely true. And if each of these companies (of those at least which represent art or manufactures, which all do not) were to make it a primary object to promote the best possible way of carrying out, both practically and artistically, the class of manufacture which it represents, we believe, as we have said again and again, that such an attempt would be likely to tell to an appreciable extent on the standard of art-work in the country. It would afford opportunities and stimulants which do not now exist, and which we entirely concur with Mr. Gladstone in saying that it is not exclusively or mainly the province of a Central State agency to afford. On the contrary, grateful as we are to the Science and Art Department for standing in the gap, and conscious as we must be of a considerable extent of good which it has done, we cannot shut our eyes to the fact that there is in the nature of the influence it exercises too large an infusion of mechanical and routine spirit, and that we have very little chance of seeing any great and imaginative artist emerge from the Government Art-Schools of the country. Nor is it to be expected that the further co-operation of such bodies as the London Companies, as suggested above, would necessarily or probably find a direct result in the way of evolving unknown artists or awaking new genius. In a small way, some of the companies have done this very thing. The Goldsmiths' Company offered prizes recently for the best designs for objects in gold and silver, but nothing very valuable in an art point of view was obtained. The effect of any such influences must be very gradual, and will in general hardly be traceable in a distinct and definite way; but it may be a real influence, in process of time, nevertheless. Mr. Gladstone illustrated this happily by the instance of music. We were now coming, he said, to a belief that music is a general inheritance,—that the faculty of music is a common faculty of people forming an intelligent community. "Was that so fifty years ago? I remember the time when you were laughed at in this city if you contended, as I was stoutly contending, that the human being, as such, was musical; you were considered a fool, a dreamer, an enthusiast. People used to say, 'I can't tell one note from another; I don't care a bit about music'; and I replied by saying, 'If the nurse who carried you when you were three or six months old had continued to carry you till you were forty, you would not be able to walk.'" That is a very fair illustration; and this advanced interest in the particular art referred to is not traceable to the efforts of any propagandism, either governmental or individual, but to a general movement of society arising, we can scarcely say how, from an increased value attached to the art, leading to a desire for its cultivation as a part of liberal education. That is the feeling which we want to see in regard to the arts of design. In the Middle Ages architecture and decorative design, in the Renaissance period painting, were universally recognised as things of great interest, and which it was, to apply a line of Pope,—

"Quite a scandal not to know"

something about; and accordingly the best intellect of the day was applied to them. That is not the case now; and Mr. Gladstone touched accidentally on an illustration of this in his reference to the hereditary taste for what is beautiful often found among those who are "well born," and his quotation of the remark of an artist to him, that a certain lady, "if she only had a proper amount of technical instruction, would be unquestionably the first painter in this country." Yet, as a matter of fact, most modern artists arise from the middle or lower classes. This is not because there is not an equal average of natural talent among those who are called the upper classes, but because they seldom make the same use of it, having no inducement to seek for fame, and having the still un-eradicated idea of social unsuitability (to put it mildly) attached to the calling of an artist. Accordingly, a majority of our art productions are the work of men with technical skill, but devoid of high refinement or associations. It is the same in other arts: no thinking person, for instance, can suppose that the stage as it is represents the amount of histrionic genius in the nation. There is no inducement for the best class of minds to turn to it. Let any art be recognised, by the general feeling of the nation, as a great occupation, worthy of persons of the best abilities and the highest position, and we should have the first condition towards the renewal of a great period of art,—a condition which the Government Schools of Art certainly have tended towards, though the progress is scarcely perceptible as yet.

We must not, however, lose sight of our subject of art as connected with industry, and with the industrial classes; and here Mr. Gladstone furnishes us with a very interesting text for some concluding remarks on this head, in a quotation from a letter of a working joiner, which he read to the Greenwich audience. We add (with a hearty concurrence), the words with which the speaker introduced the quotation:—

"In my belief—I speak it frankly—there is far too much eagerness on the part of the working-classes—I do not say for themselves, but at any rate for their children—to get out of the working-class into another, which is not the working-class; and I have a consideration to urge in support of that which I say, and of the advice I would presume to give, that advice being, Be not eager to raise your children out of the working-class, but be desirous that they shall remain in that class and elevate the work of it. Not long ago, in a town near which I live, it was my duty to say something upon this subject, to make a rough division between head work and hand work, and I made this division probably in a manner not sufficiently accurate and careful. Two or three days after, I received a letter from a working man, who thought I had treated society as if it were a pyramid you might cut across at a particular point, and say, 'Above that all is head work; underneath, all is hand work; where there is head work there is no hand work; where there is hand work there is no head work.' That was the language he understood me to hold, and he writes to me in words which are original and worth reading. He describes himself as a young carpenter who works ten hours a day, and says 'If the carpenter is a thoroughly skilful workman a selection of the best work is given him, and I assert with the most complete truth that during the progress of his work a constant communication must be kept up between his brain and his hands, not merely passive in character, but active, concentrated, and almost unintermittent. It is necessary for him to consider economy of time and labour, and I might add material; ready methods of mechanical resource must suggest themselves to his mind, his eye is being educated with new forms of design and finish; and in proportion as machinery supplants in heavy work the manual labour of the artisan, are fresh demands made upon the intellectual resources of the craftsman.' That is an excellent passage; it shows you better than any words of mine can do how the operations of the mind enter into the labour of the hands."

The letter of Mr. Francis Moore (we agree with Mr. Gladstone that his name deserves mention) is amongst the most significant and suggestive paragraphs in the Greenwich address upon art. It suggests the direction in which a higher class of workmanship, rising to the title of "art-workmanship," is to be sought for. It is not so much by seeking to add on to it something new and separate in its essence which we call "beauty," as by refining and finishing work to the utmost point of excellence, which includes excellence of form as well as excellence of construction, that we are likely to arrive at anything like that characteristic of Greek art referred to in the early part of the address,—the uniform beauty of treatment in the smallest as well as the greatest things. The attainment of this needs also, of course, the training of the eye and of the perception by drawing, and by the study of good and artistic forms of work; and perhaps even a more important step towards it is a higher standard of general cultivation and education among working men. And this consideration the more emphasises what Mr. Gladstone remarked immediately afterwards, that "if a man is a carpenter or a stonemason, it is a poor and vulgar thing if his great object is to get his children out of his vocation. The first thing is to elevate the vocation and to see that better products come from the labour; that is the walk which is opened to him by Providence and by his calling in life. That is the special work to which he ought to address his energies, and for it there is unbounded scope." Earnestly do we wish to see this idea more acted upon; to see it practically illustrated that a man may attain to being in every important sense an educated man and a gentleman, without thinking it necessary to such a claim that he should lay down or be ashamed of a noble and useful manual craft of whatever kind, in order to swell the already over-crowded ranks of those who are on the look-out to sell their brain-labour without the contamination, as it seems to be considered, of mechanical handiwork; though, except in the very lowest occupations, the two cannot really or advantageously be separated. "Every honest occupation," says Mr. Froude, in the address delivered when he was Rector of St. Andrew's University, "to which a man sets his hand, would raise him into a philosopher if he mastered all the knowledge that belonged to his craft. Every productive occupation which adds anything to the capital of mankind, if followed assiduously with a desire to understand everything connected with it, is an ascending stair

whose summit is nowhere, and from the successive steps of which the horizon of knowledge perpetually enlarges."

We made a note a little while since of a letter which caught our eye, addressed by "A Bedford Artisan" to one of our daily papers, in repudiation of the idea that foreign, especially German workmanship, was better than English; in which the writer named as the three main attributes of a good workman "energy, deftness, conscientiousness"; and added, "I believe the superiority of English work lies chiefly in this, that with all our faults we put more conscience into our work than workmen of most other countries do." We should be very willing to give credence to this view, at any rate; and entirely accept the theory as a very good reason for superiority of workmanship, whether it be considered to be specially true of the English workman or not. Well, then, let the workman who has contrived to educate himself beyond his fellows, to arrive at a knowledge of design, at a power of distinguishing good form from bad, and of understanding the relation between the practical utility of an object and its form and finish, instead of taking his higher knowledge and perception away from his own trade, apply them rather to raise the character and quality of its productions, and he will be likely to get very near to "Art" as it has been defined by one of the clearest intellects of this century. "If I were to define art," says John Stuart Mill, "I should be inclined to call it *the endeavour after perfection of execution*. If we meet with even a piece of mechanical work which bears the marks of being done in this spirit,—which is done as if the workman loved it, and tried to make it as good as possible, though something less good would have answered the purpose for which it was ostensibly made,—we say that he has worked like an artist." If the educated workman, who has acquired a perception of artistic beauty, will, besides "putting his conscience into his work" in regard to its practical execution, carry the operation of conscience a step higher, and aim also at the best and most perfect form in his work, he will have done something to establish a real and fruitful relation between Art and Industry.

ROUND NEWGATE.

The late excavations in the immediate neighbourhood of Newgate, which have brought to light certain portions of the old city wall, have attracted much attention in archæological circles, and Mr. Alfred White has maintained, in opposition to received opinion, that the Romans never occupied this portion of London, and that there are not the least remains of Roman work in the neighbourhood of Newgate-street. We do not propose to discuss this point now; but we may note here that Mr. Roach Smith, well known as an authority on Roman London, threw out, some years ago, the very ingenious suggestion that Green Arbour-lane, which led into the Old Bailey, was the site of a Roman theatre. He presumed that the precipitous descent of Green Arbour-lane into Seacoal-lane was caused by an ancient excavation in the side of Snow-hill, and having noticed in his travels that much smaller towns than London were invariably supplied with a theatre, which was usually built into a hill or rising ground, he naturally fixed upon this remarkable position just outside the city walls as a likely place for one.

The ancient walls, doubtless, enclosed much waste space, and it was not until Norman times that the north-west corner of the City was sufficiently built upon for an opening in the wall to be required. The name New-gate points to the fact that it was the last built of the City gates, and its construction in the reign of Henry I. was necessitated by the closure of an important thoroughfare by the power of the Church. When the old metropolitan church of St. Paul, founded A.D. 610 by Ethelbert, king of Kent, was partially destroyed by fire in the reign of William the Conqueror, Mauritius, then Bishop of London, instead of repairing it commenced the erection of a new one upon a greatly extended plan. The succeeding bishop, Richard de Beaumain, carried on his predecessor's scheme, and bought up "the large streets and lanes round about, wherein were wont to dwell many lay people," in order to form a large cemetery or churchyard. The present road was then occupied by buildings attached to the cathedral, and the consequence was that the highway from Aldgate through Cheap to Ludgate was stopped up by the churchyard wall, and passengers were forced to go round by Paternoster-row in order to get to Ludgate. This evil was so strongly felt by the laity that it became necessary to open up a new thoroughfare, which was done by the erection of Newgate. By this means not only was a convenient outlet to the west through Holborn obtained, but also easy access to Smithfield, the place of public sports.* The New-gate originally opened into a large open space, and not as now into a street of houses. Near the east end of this space, by St. Martin's-le-Grand, was the church dedicated to the Italian St. Nicholas, who was Bishop of Mira in the fourth century, and from this the row of butchers' shambles which stood in the middle of the space took the name of St. Nicholas' Shambles. Stow writes:—"Stall-boards were of old time set up by the butchers to show and sell their flesh meat upon; over the which stall-boards they first builded sheds, to keep off the weather, but since that, encroaching little by little, they have made their stall-boards and sheds fair houses." Behind these, on the south, was a narrow passage, called Mountgoddard-street, consisting principally of low drinking-houses, with slaughtering-places in their rear. Goddard was the old word for a cup or tankard, and Stow hints that the contents of the cups often confused the heads of the frequenters of the places. The butchers had this district pretty much to themselves,† and the filth that accumulated about their slaughter-houses soon became a public nuisance. The thoroughfare now known as King Edward-street, from its neighbourhood to Christ's Hospital, was originally named Stinking-lane, from this cause; but the name became corrupted, and in the curious plan of the district, preserved among the archives at St. Bartholomew's Hospital, it is marked as "Fowl or Chicking-lane." The name was afterwards changed to Blowbladder-street, then to Butcher Hall-lane, and, in 1843, to King Edward-street. Stow informs us that, "in the third year of King Richard II. motion was made that no butcher should kill flesh within London, but at Knightsbridge, or at such other distant place from the walls of the city"; still the nuisance remained, and nothing was done until a special Act was passed in the reign of Henry VII. (4 Hen. VII., cap. 3) for the purpose. The Act, after reciting a petition of the parishioners of St. Faith and St. Gregory's, complaining that great concourse of people at St. Paul's were annoyed, &c., "by the slaughter of beasts and scalding of swine in the butchery of St. Nicholas' Shambles, whose corruption and foul ordure compasseth two parts of the palace where the kyng was wont to abide when he came to the Cathedral, to the jeopardous abydynge of his most royal persoun," enacted certain penalties against any butcher or his servant slaying any beast there. After the Great Fire, a market-house was provided in place of the open stalls, and, in spite of all complaints and attempted remedies, Newgate Market remained the chief meat market for London until the erection of the new building at Smithfield.

The unoccupied plot of ground between Newgate-street and the northern wall was built upon in the thirteenth century, when the Grey Friars took possession of it. No friars of the Franciscan order had settled in England before the eighth year of the reign of Henry III., but then a small body came over to this country from Italy. Some of these men stopped at Canterbury, and the others proceeded to London. At first they lodged with the Dominicans, in Holborn, and afterwards were domiciled in a house on Cornhill, which belonged to John Travers, one of the sheriffs, in the year 1215; but no long time elapsed before a handsome building was commenced for their reception near St. Nicholas' Shambles. The friars obtained a high reputation for piety, and money flowed in upon them, John Iwyn, mercer, being their principal benefactor. About the year 1239 a church and other buildings being required for a complete conventual establishment were commenced. "William Joyner, afterwards mayor, builded their quire; Henry Wallis, the body of the church; Walter Porter, alderman, the chapter-house; Gregory Rokesly, their chambers; Bartholomew of the Castle, made the refectory; Peter de Helyland made the infirmary; Bevis Bond, king of Heralds, made the study, &c." Either some of these worthies did their work ill, or the establishment must have suffered by fire, for about the year 1306 a new church was commenced with the erection of a choir by Queen Margaret, second wife of Edward I. John de Dreux, Duke of Britaine and Earl of Richmond, built the body of the church at an expense of three hundred pounds, and he moreover gave jewels and ornaments to be used in the religious ceremonies of the church. The friars were highly popular, and obtained large benefactions from all classes, from members of the Royal family down to plain citizens. Robert Lord Lisle, joined himself to the order; and the celebrated Sir Richard Whittington erected at his own expense a library for the use of the friary, and filled it with books, at a further cost of four hundred pounds. The church was noted for its beauty, the pillars and pavement being of marble, and the windows marvels of art, but its chief glory lay in the large number of monuments to the memory of distinguished people which it contained. Four queens, four duchesses, four countesses, one duke, two earls, eight barons, and thirty-five knights were buried in the precincts of the convent. The evil day, however, came at last, and when Henry VIII. suppressed the religious houses, the Grey Friars were forced to agree to their own extinction. On the 12th of November, 1539, Thomas Chapman, the warden, and twenty-five of the brethren, signed and sealed the deed of surrender, and the church was shut up. The ornaments and goods were taken for the king's use, and the building was converted into a receptacle for the prizes taken at sea from the French. Christ Church, Newgate-street, the last-formed parish in the City of London, was now founded by the union of St. Nicholas' Shambles and St. Ewins, with a portion of St. Sepulchre's added, and much of the property of the Grey Friars was given for the purpose of endowing it. The two old churches of St. Nicholas and St. Ewin were sold at this time for 1,200*l*. In the last days of Henry's life he presented the site of the friary, and the priory of St. Bartholomew, to the City, for the relief of the poor, and on the 3rd of January, 1546, Bishop Ridley announced to his audience at Paul's Cross what the king had done. The citizens were left to dispose of the property as they thought fit, and in 1552 they prepared the Grey Friars' house to receive 400 destitute children. Thus was founded Christ's Hospital, and the opinion that Edward VI. was the originator of the institution appears to have grown up in later times. He recognised the work the citizens had done, but Ridley himself attributes the whole credit of the foundation to the City magistrates,—to Sir Richard Dobbs (the first treasurer) and Sir George Barnes, the two lord mayors in whose civic reigns the restoration was effected. Very little of Christ's Hospital escaped the Great Fire, and most of the present buildings have been erected at different times since then. The town ditch, which ran through the property, was built over about 150 years ago, but the square which occupies part of the site is still called "the Ditch." Another square, which was the garden or burial-place of the old convent, is still called "the Garden." Outside the ditch was formerly the burial-ground of criminals, but about one hundred years ago the Corporation gave the Hospital a lease for 800 years. The handsome swimming-bath which has lately been made for the boys, is partly over the ditch, and in some places the foundation had to be sought 15 ft. below the level. The great hall was built half over the ditch and half over the wall. The site of the Blue-Coat school, owing to its central position, is so valuable that 500,000*l*. have been offered and refused for it. Most of the City gates were used as prisons, and the New-gate was no exception to this general rule. It was probably so used from the time of its first erection, as Henry III., in the year 1218, commanded the sheriffs of London to repair the jail of Newgate for the safe keeping of the prisoners. The same king, in the year 1255, kept the sheriffs prisoners here for a month or more as a punishment for having let a prisoner escape. The gate and jail were "re-edified" in the reign of Henry VI., and being partially destroyed in the Great Fire were again rebuilt in the year 1672. Old Newgate remained with little alteration until 1780, when an enraged mob, during the Gordon riots, burnt it to the ground and set the prisoners free. There is a curious answer to the question, "What became of the prison keys?" in *Notes and Queries* (5th Series, III. 167), where it is stated that they were thrust into a footman's hands by one of the ringleaders of the mob. The unwilling receiver threw them into the water in

* Some writers have affirmed that the name Newgate was only given to the gate when it was rebuilt, and that there had been an entrance into the city here ever since the first building of the wall, the old name being Chamberlain's-gate.

† There was originally a meal market here, as well as the more famous meat market.

St. James's Park on the advice of his mistress, and there they were found some years ago when the lake was cleared out.

As early as the reign of Henry V. the jail was too small to properly accommodate the prisoners who were sent to it, and the consequence was an outbreak of fever, which killed sixty-four persons, besides the keeper and turnkeys. About two centuries and a half after this calamity occurred, Thomas Ellwood, Milton's amanuensis, was confined in Newgate with some other Quakers, and in his autobiography he gives the following full description of his quarters:—"We had the liberty of the hall (which is on the first story over the gate, and which, in the day time is common to all the prisoners on that side, felons as well as others, to walk in, and to beg out of), and we had also the liberty of some other rooms over that hall to walk or work in a-days. But in the night we all lodged in one room, which was large and round, having in the middle of it a great pillar of oaken timber, which bore up the chapel that is over it. To this pillar we fastened our hammocks at the one end, and to the opposite wall on the other end, quite round the room, and in three degrees or three stories high, one over the other; so that they who lay in the upper and middle row of hammocks were obliged to go to bed first, because they were to climb up to the higher by getting into the lower. And under the lower rank of hammocks, by the wall sides, were laid beds upon the floor, in which the sick, and such weak persons as could not get into the hammocks lay; and, indeed, though the room was large and pretty airy, yet the breath and steam that came from so many bodies, of different ages, conditions, and constitutions, packed up so close together, was enough to cause sickness amongst us, and I believe did so, for there were many sick, and some very weak; and though we were not long there, yet in that time one of our fellow-prisoners, who lay in one of those pallet-beds, died." It was necessary to hold a coroner's inquest upon the body of this poor man, and the usual practice in such cases was for the turnkeys to run out into the street under the gate, and seize upon the passers-by, until they had a sufficient number for the purpose. On this occasion they laid hold of a grave citizen, who "pleaded hard, begged and besought them to let him go, assuring them he was going on very urgent business, and that the stopping of him would be greatly to his prejudice. But they were deaf to all entreaties, and hurried him in, the poor man chafing without a remedy." They soon, however, wished that they had not meddled with him, for he insisted on seeing the place where the man died. On entering the room he exclaimed,—"Lord bless me, what a sight is here! I did not think there had been so much cruelty in the hearts of Englishmen, to use Englishmen in this manner! We need not now question how this man came by his death; we may rather wonder that they are not all dead, for this place is enough to breed an infection among them. Well," added he, "if it please God to lengthen my life till to-morrow, I will find means to let the king know how his subjects are dealt with."

Although all this should have been well known, the prison was allowed to continue in its crowded and ill-ventilated state until a popular outcry arose in the year 1770, when Mr. Akerman, one of the keepers, stated in his evidence before the House of Commons that, independently of the mortality among the prisoners, nearly two sets of servants had died of the jail distemper since he had been in office, and added that he remembered "when two of the judges, the lord mayor, and several of the jury and others, to the number of sixty persons and upwards" died in the spring of 1750 of the disease, which was communicated from the prison to the Sessions House adjoining. On May 31, 1770, the first stone of the present prison was laid by Alderman Beckford, but little spirit was put into the work, and ten years afterwards, when the old prison was destroyed, the new one by its side was still incomplete. In the autumn of last year, when the houses at the west end of the north side of Newgate-street were pulled down, a considerable portion of the foundations of old New-gate was brought to light, and its position was then seen to be within the parish boundary-mark on the wall of the present Newgate prison. Next to the gate which crossed the present street was the conduit, situated within the Conduit-yard, next Swan-yard. When the new prison was built it had to follow the tortuous line of the old houses in Warwick-lane, and the walls of these houses helped to enclose a lane outside the main building which was used as a burial-place for the criminals, and also as a passage for the prisoners to walk along from the prison to the Central Criminal Court. At the period of the Fenian riots this was enclosed and made more secure.

The Old Bailey, outside the gate was originally the ballium or vallum, which was under the charge of the Bailiff or Bayle reeve. Here stood Sidney House, once the residence of the noble family of Sidney, before they removed to Leicester House, in the fields beyond St. Giles's. In later times the inhabitants were not so aristocratic, and the near proximity of the place to the prison caused it to be frequented by some very indifferent characters. Thus, Jonathan Wild, the notorious thief and thief-taker, lived at the second door south of Ship-court.

The Old Surgeon's Theatre was in the Old Bailey, and Goldsmith was living at Green Arbour-court, opposite, when he was rejected there.

Warwick-lane was originally called Eldeneselane, but obtained its present name from Warwick House, the mansion of Richard Nevill, Earl of Warwick, the king-maker, who kept here an open table for his numerous retainers. The lane is not over wide now, but it was formerly particularly narrow. After the fire it was widened, and the Court of Judicature* gave compensation to St. Bartholomew's Hospital for the piece of ground taken in.

The position of Warwick House was a favourable one for so meddlesome a man as the great Earl, as there was a tower at the end of his garden from which he could telegraph to Westminster, and also a private way through the wall, which he could use without letting the warders at Newgate know of his movements. The neighbourhood must have borne a gay appearance when his 600 men dressed in red jackets, embroidered with ragged staves, were moving about it. The Hall of the College of Physicians occupied the site of Warwick House for many years, and here the body of Dryden was brought by Sir Samuel Garth, to whom the remains of the poet are indebted for a suitable interment. He proposed and encouraged a subscription for the expense of the funeral, pronounced an oration over the body, and attended it from Warwick-lane to Westminster Abbey, where it was conveyed on May 13th, 1700, followed by more than a hundred coaches. The first meetings of the College after its establishment in 1518 were held in Linacre's house, in Knightrider-street, but in course of time, this not being found large enough, a house was taken of the Dean and Chapter of St. Paul's, at the bottom of Amen-corner. In the hall of this mansion the fellows placed the statue of Harvey, which was destroyed in the Great Fire. Behind was a garden in which Harvey built, at his own expense, an elegant convocation-room and a museum, which was filled with choice books and surgical instruments. On February 2, 1653, he invited the members to an entertainment, and presented the college with a deed of gift of the buildings. After the Fire the meetings of the Fellows were generally held at the house of the president until the new building in Warwick-lane was finished. The ground was purchased, and the house commenced by Wren in 1670. In four years it was completed, and on February 25, 1674, was opened with very little ceremony under the presidency of Sir George Ent. The dome was taken down about seven years ago,—

> "A golden globe, placed high with artful skill,
> Seems to the distant sight a gilded pill."

The workshops of Messrs. Tylor, the eminent engineers, now occupy the site of the college, and during the excavations that have lately been made for the purpose of enlarging them, as we mentioned at the time, portions of the City wall have been disclosed. With considerable public spirit Messrs. Tylor have decided to preserve these bits, and they have so built round them that the brickwork may remain as a witness to the thoroughness of the old builder. The Oxford Arms, on the west side of Warwick-lane, is one of the very few old-fashioned galleried inns that is left, and it will soon be cleared away. At the end of Warwick-lane is Amen-corner, where the houses of the Canons Residentiary of St. Paul's are situated. One of these was occupied by Barham, the author of the "Ingoldsby Legends," and the nearness of his house to Newgate will account for the frequent introduction of references to executions in his verses. The great and good Archbishop Leighton wished to die at an inn like a pilgrim going home, and he had his desire, for in 1684 his life went from him while he was stopping at the Bell, on the east side of Warwick-lane.

The streets and houses in this quarter of London are full of interest, but day by day the old buildings pass away, and the new ones, being devoted to business alone, will not have the same hold upon our sympathies that the former possessed.

* A Court of Judicature was erected and revived by several Acts of Parliament for the determination of differences touching the houses which were burned or demolished by reason of the Fire of London. It sat from 1666 to 1675.

SIR JOHN RENNIE'S AUTOBIOGRAPHY.*

During the spring of 1814, Mr. John Rennie, junior, was sent by his father, under the direction of Mr. Francis Giles, to make a survey of the channel between Scotland and Ireland; which led to the ultimate selection, by the Trinity Board, of Port Patrick on the Scotch, and Donaghadee on the Irish side, for both of which harbours Mr. Rennie was directed to prepare designs. Great interest attaches to this survey, from the adoption by Mr. Giles and Mr. Rennie of that scientific mode of triangulation which is now almost entirely resigned to the officers of the Royal Engineers. A base line of six miles in length was carefully measured on a sandy flat at the head of the Bay of Luce, as the foundation of the general survey, to which all the detailed hydrographic charts were referred. A detailed description of these and the other harbour works of the Rennies is given in a work entitled "The Theory and Formation of British and Foreign Harbours," which was published in parts by Weale between 1845 and 1854. It forms in all two volumes, folio, and was dedicated by Sir John, by permission, to her Majesty. Sir John received tokens of honour from the sovereigns both of Russia and of Austria in reference to this publication.

On the death of Mr. Rennie, which occurred in October, 1821, his business was divided between his two elder sons, who remained in partnership as to the works in Holland-street. The principal part of the mechanical business fell to the late Mr. George Rennie, M.I.C.E., while the completion of the engineering works devolved chiefly on Sir John. Thus the latter succeeded his father as engineer to the Admiralty at the early age of twenty-seven. His next appointment was that of engineer to the Eau Brink Commissioners; that of engineer to Ramsgate harbour followed; then the charge of Sunderland, Donaghadee, Port Patrick, and Kingston harbours, the West India Docks, the new dockyard at Sheerness, a dry dock at Chatham, the Plymouth breakwater, the Devonport Victualling Office, and the great metropolitan bridge, of which we have already given some account. A monograph of Plymouth breakwater, a thin folio volume, has been published by Mr. Weale.

The works, however, of Sir John Rennie to which, in the actual state of professional knowledge, it seems to us most important to direct attention, are those which relate to the drainage of the fens, the provision of river outfalls, and the protection of low-lying lands, and of coasts exposed to strong tidal currents, from abrasion by the sea. In works of this kind, a century ago, we had to look to the Dutch for examples. There is very little doubt that Sir John Rennie taught the Dutch engineers to look up to him.

That we are not unreasonable in attaching great importance to a more thorough study of hydraulic engineering will appear from the following facts. The last few years have made us acquainted with the existence of hydraulic phenomena entirely unsuspected, the discovery of which vitiates the *formulæ* hitherto relied on for ascertaining river discharge. In the great South American rivers of the Parana and La Plata it has been found, by actual observation, that a strong undercurrent co-exists with a placid and motionless surface. In the Bosphorus and the Dardanelles the co-existence of inward and outward currents, interpenetrating one another, has been detected by the officers of the Admiralty. The same is the case in the Straits of Gibraltar. The advice given, on hydraulic matters, by the Admiralty engineers, on occasions mentioned by Sir John Rennie, turned out to be remarkably ill-judged. In India, where drainage, reclamation, and irrigation assume an importance far greater than in any other portion of

* See p. 965, *ante*.

the British Empire, disasters arising from defective engineering have not been so rare as could be wished.

When we reflect on the vital importance to our Indian Empire of the services of the hydraulic engineer, and when we observe, in accounts by no means likely to make the worst of matters, how great a want of professional ability has been displayed, we feel that it is difficult to insist too strongly on the importance of study of the works of so successful a man as Rennie. The river basins of India cover an area of more than two millions of English square miles; that of the Ganges alone containing 391,000 square miles. Throughout this immense territory there are only two regions which are not dependent, either in whole or in part, on irrigation. In the rainless and arid districts, vegetation depends entirely on the water supply brought by canals from higher levels. In all parts of the Indian empire constant supervision is needed. The rivers burst their own banks, choke up their own mouths, dig new channels for themselves, and spread desolation, instead of fertility, over the country, when neglected by man. By the aid of hydraulic engineering, arid or pestilential districts are converted into luxuriant gardens. Not only so, but the recurrence of those terrible droughts, from which no tropical country seems to be altogether exempt, sweep off the population by hundreds of thousands. If the droughts cannot be prevented, at all events their evil influences can be reduced to manageable dimensions by the foresight of the engineer. Sir J. Rennie only claims to have applied, in those cases in which he was consulted, the system of his father. That system is that of common sense. It aims at aiding the processes of nature by working in accordance with natural law. The same principle that was adopted by the elder Mr. Rennie in his report on the improvement of the Nene, was applied by his son in the cases of the Eau Brink Cut and of the improvement of the Witham and the Ancholme. Not only so, but in his tour through Italy in 1819-1821, Sir John Rennie pointed out how thoroughly the same principles controlled the two great hydraulic phenomena of Italy, the lagoons of Venice and the Pontine Marshes. It is very remarkable that in the very week in which Sir John Rennie's autobiography was published, accounts should have reached us, founded on reports from Signor Romano, of the rapid change that is menacing the very existence of Venice. It is due to the fame of the English engineer to cite what Sir John wrote on the subject, and to compare it with subsequent events:—

"There was a long-continued discussion amongst the numerous distinguished mathematicians, engineers, and others who have written upon this subject, as to the best way of preventing the filling up of the harbour. Some contended that the only method of effecting this was to admit all the rivers into the lagoons freely; for although they might deposit a certain amount of alluvial matter, nevertheless the great quantity of water discharged would alone be sufficient to carry away this deposit. But they forgot that when the rivers met the sea the current would necessarily be checked, and rendered powerless to carry forward any matter which might be held in suspension, and that, consequently, the detritus would be deposited, and form banks and shoals which the waters could not remove; thus in time the lagoons would be filled up, grass marshes would be formed, the city of Venice would be united to the mainland, and the harbour would be destroyed. On the other hand, it was argued, for the reasons above mentioned, that the only way to preserve the lagoons and the port of Venice was to exclude the rivers when densely charged with alluvial matter, and only to admit their waters at certain times, when they were comparatively clear: thus all the advantage would be obtained from the scour of these rivers, without the disadvantage arising from their deposits. Ultimately the arguments of the latter prevailed, the rivers were excluded from the lagoons by making a capacious canal all around them, with sluices at their mouths, by means of which the waters were discharged into the lagoons when they were tolerably clear of alluvial matter; the surplus waters were discharged into the adjacent sea clear of the lagoons, and any alluvial matter which was brought in from the sea was removed by dredging from the main channels of the lagoons, so that they were in a fit state to admit the tidal waters, and thus to keep the lagoons open.

But there was another important agent to be provided against, namely, the alluvial matter brought in by the winds, waves, and currents from the scouring of the adjacent shores of the Adriatic: this is done to a certain extent by dredging. Originally these banks contributed materially to the formation of the outer banks, which protect the lagoon on the sea side. If these banks were broken through, or completely swept away, which the storms of the Adriatic frequently threatened to do, the lagoon, and with it the port, would be seriously injured or totally destroyed. This was remedied by defending this outer barrier bank of the lagoon by facing it with stone, and, where the sea was most violent, by constructing a solid breakwater of stone, and protecting it further by stone filters carried out a sufficient distance into the sea, in order to divert the current, and to enable the alluvial matter to be deposited between them, so as to form an additional protection to the main breakwater. This was accordingly done, and thus an extraordinary work, at great expense, has been constructed between Lido and Malamocco, the principal entrances from the sea to the lagoon, for a length of four miles, where the effects of the sea are greatest."

The preceding extract gives the opinion formed by Rennie in 1819. Twenty-one years later the floods of the Brenta caused so much damage to its banks, that the Austrian engineers rearranged the system of the discharge of this river, and did the very thing condemned by the theory of the Rennies, namely, turned the current of the river into the lagoon. The consequence has been that, in the thirty-four years which have followed this alteration, the bottom of the lagoon, which has an area of upwards of 120,000 acres, has been raised by ·75 mètre, or more than three-quarters of a yard, in depth; while the delta of the Brenta has actually advanced 7 kilomètres, or to within 3 kilomètres of Chioggia, menacing the city of Venice with speedy destruction, at least as far as relates to its peculiar character of a water city.

The chief drainage and reclamation works executed by Sir John Rennie were in the great eastern fen districts of England. In 1822 he completed the Eau Brink cut, near King's Lynn, by which a lowering of 7 ft. was gained for the waters of the Ouse. In 1831, in conjunction with Mr. Telford, he completed the outfall of the Nene, below Wisbeach, which had the effect of lowering the water-level by 10 ft. 6 in., and which would have been still more efficacious had the improvements designed by Sir John in the neighbourhood of Peterborough been carried out. In 1827-28 he restored the harbour of Boston, by forming a new channel for the course of the Witham below that town. The navigation was so improved by this work, at an expense not exceeding 33,000*l.*, that instead of the town being inaccessible, even for fishing-boats, on the neap tides in the summer and dry season, vessels drawing from 15 ft. to 16 ft. could ascend at spring tides, and those drawing from 12 ft. to 13 ft. at neaps. Sir John Rennie further executed various improvements on the Welland. The effect of these works, combined, was to facilitate the drainage of 800,000 acres, and to reclaim 6,000 acres which were before absolutely useless.

A still more complete scheme for the improvement of all the rivers falling into the Wash, was proposed by Sir John Rennie, after a careful personal survey of the entire district. By this plan the navigation of the Nene, Ouse, Welland, and Witham would have been facilitated; the water permanently lowered; and from 150,000 to 200,000 acres of land would have been reclaimed from the sea. The boldness of the plan was in advance of the enterprise of the day. Only certain portions of the scheme have as yet been carried out; but the result has been such as amply to justify the prevision of Sir John Rennie.

It is the more important to insist on the success that has attended the execution of works based on sound hydraulic science, and the failure of those which have been otherwise conducted, from the fact that the entire sanitary engineering of the country is intimately connected with this branch of professional study. The great principle grasped by Mr. Rennie was this. If flood and torrent water be thrown into a still or a slow water system, the outfall is strangled, and the entire system is disarranged. A catch-water for hill torrents, in one form or another, is the great preservation of all low-level drainage. The same principle applies to the question of the admixture of storm waters with sewage. As matter of cost, this admixture is highly wasteful. In the recent storms, from 4 in. to 5 in. of rainfall has been registered, in certain localities, within twenty-four hours. This is a three-months' ordinary rainfall for the driest parts of the country, and about a seventh part of the annual rainfall in other districts. By turning this into the sewers, the necessity for so increasing the capacity of the entire system of drainage, pumping, and outlet, as to meet the sudden strain of a double, triple, or manifold increase of duty, is gratuitously created. Had Sir John Rennie been engineer to the Metropolitan Board of Works, those ugly questions as to the metropolitan sewerage which loom in the future would have been anticipated and solved.

The well-earned fame of Sir John Rennie was by no means confined to his native country. In 1852 he laid out a system of railways for Sweden. In 1855 he designed a series of railways and five harbours for Portugal, including a harbour of refuge at Oporto. His services to that country were not limited to his scientific advice. He gave valuable counsel to the Government of his Most Faithful Majesty as to the proper steps to be taken to remove that ban of the English Stock Exchange, in face of which it was useless to attempt any sound and extensive enterprise in Portugal. He designed a breakwater at Ponte Delgada, at the island of St. Michael, one of the Azores. He reported to the municipality of Vienna as to the water-supply of that capital. Almost his last public service was to act as chairman to the Civil Engineering section of the International Exhibition of 1862.

On the introduction of the railway system into this country, Sir John Rennie designed a line of communication between London, Liverpool, and Manchester, the adoption of which would have saved very much subsequent expense in the construction of duplicate lines. The same thing may be said with regard to his designs for the South-Eastern district. Every railway scheme in those days, however, was fiercely contested in both Houses of Parliament, and was ultimately decided on grounds of which the scientific excellence of the project formed the least prominent portion. Sir John had reason to think that he was hardly used on more occasions than one. But the perfect good temper with which he speaks of his opponents, and the high tribute which he bears to the talent of the Stephensons, both father and son, is one of the most noble characteristics of a singularly manly and upright character.

The sketches of life and manners, and the personal portraits which are scattered through the autobiography, possess extraordinary interest for the general reader. Names once well known, if now somewhat forgotten, come out as living entities in his pages. The glee of Sir Thomas Maitland in foreseeing the arbitrary measures into which one of the most radical of his lieutenants was likely to glide, and in witnessing the fulfilment of his anticipations, is extremely characteristic. So is the old-fashioned obstinacy of old Telford, when, at upwards of seventy years of age, he had been, in company with his junior fellow engineer, Rennie, thoroughly drenched in an Eastern Counties survey. Sir John went at once to bed, while his clothes were dried. Telford called for the newspaper, had a great fire made up, and sat himself down to dry. When the younger man, after a refreshing nap of two hours, came down dry and comfortable, he found the elder *nearly dry*, and the room so full of steam as to render Telford all but invisible. He reproached his companion for his effeminacy in going to bed, but very nearly paid the cost of his hardihood with his life.

We hope that we have said enough to show to our readers the merit, both professional and literary, of this charming volume. Its pages will well repay more than a cursory perusal. We hope that its reception by the public will be such as to ensure the prompt publication of the remainder of the literary remains of Sir John Rennie. These include the Life of his Father, to which reference is made in the autobiography. We believe that this contains a history of all the works of Mr. Rennie, with abstracts of his most important reports. There are also several volumes of Essays on Engineering subjects, chiefly those of a hydraulic nature, and a History of Engineering, which, even if not complete, cannot fail to prove a valuable addition to our professional libraries. We can ill afford to lose any work of the matured experience of Sir John Rennie.

ON THE DECORATION OF BASILICAS AND BYZANTINE CHURCHES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.*

As there is no single example of a Basilica remaining in which all the decorative features exist, it is difficult, said Mr. Pullan, to realise what the primitive church was in its pristine splendour. The two churches which best help us to imagine what old St. Peter's at Rome and old St. Paul's in London originally were like, are St. Paul's without the walls at Rome, and St. Apollinaire il Nuovo at Ravenna. It is true that in the restored San Paolo the decoration has been only in part revived, but what has been done, has been executed in good taste in mosaic and coloured marble, and therefore we are able to form a better idea of what the effect of a decorated basilica was from this than from any other building in Rome. In the other basilicas late frescoes have for the most part usurped the places of mosaic, and small cinque-cento mouldings have concealed the severe simplicity of the early architecture. A short description of San Paolo, as it

* See p. 1047.

stood before the fire, may therefore be interesting to those who have not yet visited Rome. The church was entered through a *quadriporticus* or *atrium*,—like those which we see at St. Ambrogio at Milan, San Clemente, and the Cathedral of Salerno,—the walls of which were adorned with mosaic or fresco, as we may now conclude from the analogy of St. Ambrogio. The whole of what would be in England the western façade (in Rome the churches are not orientated) was covered with mosaics of saints on a gold ground, such as those we still see at Sta. Maria in Trastevere, Sta. Maria Maggiore, San Frediano at Lucca, and in the restored fronts of San Lorenzo and Sta. Pudentiana; in the two latter cases the restorers have unfortunately been content with painted imitations of the original mosaics. It would tend to illuminate the gloom of London if the exteriors of our churches and other public buildings were decorated with colour. Frescoes might be blackened by the smoke, but the mosaics or painted tiles would only require occasional washing, and they might be protected from the frost by a vitreous coating, or even covered with plate glass. Our climate is not so severe as that of central Germany, yet there we find, at Munich and elsewhere, external polychromatic decoration extensively practised. Some years ago the exterior of the portico of St. Vincent de Paul, Paris, was partly adorned with paintings on lava; these were removed shortly after their execution, not on account of the unsatisfactory effect of the colouring, but because the character of the drawing was such that it offended the susceptibilities of the Parisians. Let us hope that the time may come when not only public buildings, but private houses, shops, and warehouses, may be beautified by polychromatic ornament, and pictures referring to the history, destination, or the occupation of the inhabitants of each edifice. Think how much more interesting and cheerful Queen Victoria-street and Cheapside would be if adorned with acres of pictures, in the place of tons of tasteless stone and compo ornaments, in the nondescript styles which characterise most of the city warehouses. A walk through London, instead of being a melancholy peregrination between blocks of blackened brickwork, would become an enlivening and instructive promenade. Our houses would resemble a parterre of many-coloured flowers; and should they be dimmed by the smoke, the occasional use of a mop would restore their original brilliancy. To return to St. Paolo, the nave was entered through bronze gates cast at Constantinople. Similar gates exist at San Zeno, at Verona, Ravello, the baptistery at Florence, the cathedral of Pisa, and elsewhere. On entering, the spectator had before him a splendid vista, 400 ft. in length by 80 ft. in breadth, interrupted only by the baldachino, and terminating in an apse covered with rich mosaics. There were, and are still, double aisles separated from the nave, and from one another by columns and arches, making the full width of nave and aisles, 250 ft. The columns were of the richest marbles from Phrygia and Africa. Those of the restored church are monoliths from the quarries of Baveno, on the Lago Maggiore, so that one precious element in the internal colouring is lost. Above the arcades ran a series of portraits of the Popes in medallions; these are restored in mosaic by the workmen in the manufactory in the Vatican. Above them were two series of pictures from Scripture history, divided by pilasters, not yet reproduced. These pictures are represented in the works of Ciampini and Gally Knight. The triumphal arch, which separates the nave from the transept, is ornamented by a mosaic of Our Lord, surrounded by the twenty-four elders of the Apocalypse, presented to the church by Galla Placidia, the daughter of Honorius, at the time of the completion of the basilica by her father, A.D. 395; this mosaic and those of the apse, partly injured by the fire, have been accurately repaired. The vast transept was 290 ft. long by 90 ft. in width. The pavement of *opus Alexandrinum* has been replaced by one of polished marble. Such was the basilica erected over the tomb of St. Paul, and such were the old St. Peter's and the old St. Paul's, more noble in effect, more gorgeous in decoration, and altogether more church-like than the new St. Peter's and the new St. Paul's on Ludgate-hill.

After describing the decorations of St. Appollinare il Nuovo, the ancient cathedral of Ravenna, built by Theodoric, and of Sta. Maria Maggiore, at Rome, Mr. Pullan went on to say that the Byzantine church, with the curved surfaces of its domes, pendentives, apses, and soffits, was more favourable for the exhibition of mosaics with gold grounds than was the basilica with its flat wall spaces. Side by side with the church on the basilican plan, which was employed by Constantine at Constantinople and Bethlehem, and which was retained to the time of Justinian, sprang up numerous circular and polygonal edifices, in imitation of the Holy Sepulchre at Jerusalem, till finally the cross with equal arms inscribed in a square (as in the churches of Sta. Sophia and St. Mark), became the typical Byzantine plan. In these later buildings the cross lights and curved surfaces affording innumerable reflections were particularly favourable for exhibiting the gold grounds. Hence mosaic was generally adopted by the Byzantines, and the best examples of it in Italy were due to the Greek artists. Even in the time of Constantine, while the vaults of the church erected in memory of his daughter Sta. Constanza were covered with a poor mosaic, consisting of a pattern of trellis work, grapes and small figures, in black and dark green on a white ground, the dome of the church of St. George at Salonica was adorned with a series of mosaics—the finest of the Byzantine period, as regards design, execution, and arrangement of colours. This latter church is circular in plan, with a projecting apse and radiating chapels in the thickness of the wall. The dome is 70 ft. in diameter, and the whole surface of it is covered with pictures. These are in eight divisions, each filled with a grand architectonic composition, in which columns, arches, entablatures, and apses are the chief features. In the centre of the picture there is generally a baldachino, on either side of which stands a saint or priest in dark robes, with his hands extended in the primitive attitude of prayer. The influence of classical traditions can be traced in these architectural backgrounds, which, to a certain extent, resemble those on the walls of the houses of Pompeii. Blue and red, of light and dark hues, are the colours chiefly employed in the cornices and entablatures. The backgrounds are all of gold. The edifices represented are of two stories, lavishly adorned with pediments, (angular and curved), loggias, porches, and apses, hung with lamps and draperies, surmounted by birds of varied forms and colours, and supported by spiral, fluted, and jewelled columns, forming altogether a most interesting study for the architect and archæologist. The mosaics on the vaults of the chapels are not less worthy of attention. They consist of geometrical patterns, interlacing circles, squares, and lozenges, inclosing fruits, flowers, and birds. The outlines are generally of a dark reddish brown; blue is the predominating colour; green and white are more sparingly used. In the mosaics of St. George we see the advantage of employing architectonic backgrounds; they relieve the blank space of gold ground without interfering with the effect of the figures. Similar backgrounds are to be seen in some of the Roman basilicas. There they generally symbolise the holy cities of Jerusalem and Bethlehem. We find them on the internal face of the chancel arch at St. Lorenzo (this before the restoration by Honorius, who reversed the position of the basilica, was the external face) and in other places. Giotto was particularly partial to them. Most of the compartments of the frescoes in the Arena have buildings or canopies behind the figures—valuable illustrations of the architecture of his time. We see them in the pictures by Taddeo Gaddi at Santa Croce; but the most pleasing example of the use of canopies is in the background of the frescoes in the chapter-house of Sta. Maria Novella, where they give extreme richness to the whole composition. In all these instances the architectural forms are indicated by bold lines with but little shading, and not much attempt at perspective. This manner of treating them is infinitely preferable to that in which chiaroscuro and foreshortening were introduced, and which culminated in the extravagant colonnades and balconies with which the ceilings of some of the seventeenth-century churches in Italy are decorated. In modern practice, these architectural backgrounds should always be designed by the architect, in accordance with the prevailing style of the building, and not left to the free fancy of the painter. Salonica, which may be called, from the number of its churches and mosaics, the Ravenna of the East, abounds with fine Byzantine remains. All the churches were at the time of the Mahometan conquest converted into mosques, and to that circumstance we may attribute their preservation. The mosaics have in many cases been whitewashed; the figures in the apse of St. George have been so treated, but that has been a preservative process. The Church of Sta. Sophia resembles, in many respects, its prototype at Constantinople. It was probably built in the time of Justinian, and by Anthemius. High up in a recess of the mountains which form the backbone of the Island of Scio, lies the small monastery of Aghia Neamone, consisting of a quadrangle of rude cells, in the centre of which stands a fine church of the tenth century, decorated throughout with mosaics. The plan of the church is rather intricate. It has an octagonal nave, with semi-circular recesses in the thickness of the walls; a central apse, two apsidal chapels, a narthex and exo-narthex. The walls are lined throughout, up to the springing of the domes and semi-domes, with slabs of purple and sienna marble, separated into panels by billet moulds. The semi-domes over the semi-circular recess of the nave are filled with pictures on gold ground, containing two or three figures each; the subjects are from the life of our Lord, the Annunciation, the Nativity, the Presentation in the Temple, &c. The principal dome was unfortunately destroyed in the Greek Revolution, and has been restored in the modern Greek style. The decorations of Sta. Sophia have been so thoroughly described by Sir Digby Wyatt that nothing more remains to be said about them. There are probably many other mosaics in remote spots in the East awaiting discovery by some chance traveller. Ravenna, the metropolis of the Greek exarchs, is more Byzantine than Byzantium itself. It certainly possesses a finer series of ecclesiastical edifices than the capital of the Eastern Empire, and as regards internal decoration, more interesting than those of Rome. The earliest of these is the Tomb of Galla Placidia, A.D. 441. To the same century belongs a beautiful little chapel in the Archbishop's Palace. The ancient baptistery of the cathedral is octagonal, and is surmounted by a dome. Here there is no regular wall-lining of marble as in the two former buildings, but in its place there are two series of arcades. The lower of these is occupied alternately by semicircular recesses and inlays of marble. In the spandrels there are figures in oval compartments, surrounded by foliage. The upper arcade has three unequal divisions in each bay, the centre being occupied by the window. The spandrels of these are also filled with foliage of a rather coarse character. Above, there are architectural decorations with columns and entablatures, rather like those of St. George, at Salonica. In the centre of the dome is a representation of the Baptism, with figures of the Apostles around. San Vitale, built in the time of Justinian, retains its original polygonal plan, but none of its original decorations, except those of the chancel, on the walls of which are the celebrated mosaics of Justinian and Theodora attended by courtiers. St. Mark's at Venice possesses the only complete series of purely Byzantine mosaics existing in Italy. These from description and illustration have become familiar to all; but the mosaics of Palermo and Monreale have so much Byzantine character about them that they call for more than a passing notice, as they afford the most complete specimens of perfect decoration. The admixture of Saracenic form in the detail gives them a peculiar *cachet* which no other churches possess. In neither of them has restoration been carried out as far as in St. Mark's. The Capella Reale of Palermo so closely resembles the cathedral of Monreale in style that a short account of the latter will suffice.*

The Rochdale Workmen's Club.—Unde the auspices of this club, which appears to possess a vigorous organisation, and to be doing much useful work, arrangements have been made by which prizes are offered for encouragement in the cultivation of skilled labour. For instance, the club offers a silver and a bronze medal to journeymen in any branch of the building trades, not necessarily members of the club, but members of a science and art class in the town, who can design the best and second-best plans for a pair of cottages suitable for working men. They further offer silver and bronze medals to apprentices in the building trades who can design plans—neatness of drawing being a necessary qualification—of a timber roof, of an iron roof, of a doorway, and of a window. These competitions are to take place next autumn.

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* To be continued.

DRY-ROT IN TIMBER.

The publication of Mr. Britton's book on Dry-Rot* has given a new fillip to the consideration of the causes of the decay of timber, and the means of its prevention.

In order to use the right kind of timber for each purpose and in each situation, we should understand the various causes of its decay,—dry rot being one form of it, and the chief one in buildings.

Dampness of the air in which the piece is situated is the chief cause of dry-rot, and stagnation of the air is the condition of its dampness. As to the temperature, it will always be more or less in different situations, and cannot in general be much altered; but it has an effect upon the rapidity of the process of decay. When the temperature is such as to allow the air to remain moist and warm, the process of decay goes on most rapidly. If the moisture is present, but the temperature low, the process goes on less rapidly; and again, if the temperature is so high as to drive off the moisture, the decay goes on less rapidly also; all these states having reference to stagnant air. But if we give motion to the air about a piece of wood liable to dry-rot,—that is, when it is either not thoroughly seasoned, or is in a damp situation,—we shall lessen the liability to decay, for the motion of the air has of itself an evaporative effect, and tends to dry the wood, and prevent the progress of decay. Hence the ends of beams in walls should not be "built in," but should be laid with a clear air-space all round. There is nothing new in this, of course; it has been known this long time; but it is often neglected without any necessity, from mere oversight or thoughtlessness.

Movement of the air is of great importance in preventing dry rot, and one of the objects in the design should be so to arrange openings amongst the timbers that the movement may take place by the action of natural forces; for, as Mr. Britton shows, a merely small admission of air, without means of producing a current, may act injuriously; for the presence of air is one of the necessary conditions of the process of decay. On this point, however, there seems to be some uncertainty, and probably the cases in which air is admitted in so small a quantity that it hastens decay, are those in which the air admitted has been the means of conveying spores of disease to the wood from some other part of the building. The author says,—"The admission of air has long been considered the only means of destroying the fungus; but as it has frequently proved ineffectual, it must not be always taken as a certain remedy. If dry air be properly admitted, in a quantity adequate to absorb the moisture, it will necessarily exhaust and destroy the fungus; but care should be taken lest the air should be conveyed into other parts of the building, for after disengaging itself from the fungus over which it has passed, it carries with it innumerable seeds of the disease, and destroys everything which offers a bar to its progress. Air, in passing through damps, will partake of their humidity; it, therefore, soon becomes inadequate to the task for which it is designed. Owing to this circumstance, air has been frequently admitted into the affected parts of a building without any ultimate success; too often, instead of injuring the fungus, it has considerably assisted its vegetation, and infected with the disease other parts of the building. The timber, which is in a state of decomposition by an intestinal decay, is little affected by the application of air, as this cannot penetrate the surrounding spongeous rottenness which generally forms the exterior of such timber, and protects the action which the humid particles have acquired in the exterior. As the extent and progress of the disease are therefore necessarily concealed, it is difficult to ascertain correctly the effect produced by the admission of dry air. Under these circumstances of necessity and danger, it will require considerable skill to effect the purpose without increasing the disease, and, as each case has its own peculiar characteristics, it is necessary, before we attempt to admit air as a remedy, to previously estimate the destructive consequences which may result from so doing, and ascertain whether it will be injurious or beneficial to the building. The joists of the houses built by our ancestors last almost for ever, because they are in contact with an air which is continually changing. Now, on the contrary, we foolishly enclose them between a ceiling of plaster (always very damp to begin with) and a floor; they frequently decay, and then cause the most serious disasters, of which it is impossible to be forewarned."

If we understand how the tree grows, we shall the more readily discover the causes of its decay when cut down and converted. The trees we have to do with grow from within, outwards, adding on a layer of wood each year. The sap rises from the ground through the stem to the leaves, where it is digested, and is returned as proper sap between the last layer of wood and the bark, and the residue passes into the ground as noxious matter, the virtues of the sap having been retained in the tree.

The wood is made up of cellular tissues, or hollow cells, and of intercellular spaces, and these latter contain air. After the sap has been deposited in the outer part of the stem it becomes perfected and deposited in the woody fibre towards the centre, "and when age has matured the tree, it is probable that the woody fibre so employed is no longer fitted for the circulation of the sap; and, also, that the perfected sap, when once deposited, does not again join in the general circulation." The heart-wood contains little fluid, and no vegetable life; the sap-wood abounds in fermentable elements. Dry-rot differs from wet-rot in this respect, that the former takes place only after the tree has been cut down, whereas the latter may begin when the tree is standing.

If dry rot shows itself in a damp closet or pantry, the inside of the china or delph lying there will be coated with a mould, or a fine powder like brick dust. This excessively-fine powder is no other than uncountable myriads of the reproductive spores or seeds of the fungus. If these excessively-minute bodies be allowed to fall on wet flannel, damp blotting-paper, or wet wood, they immediately germinate and proceed to reproduce the parent fungus. The red skin of the spores cracks at both ends, and fine mycelial filaments are sent out: this is the mould, spawn, or mycellium from which the new fungus (under favourable conditions of continued moisture) appears.

"It matters little," the author says, "whether wet is applied to timber before or after the erection of the building. Timber cannot resist the effect of what must arise in either case, viz.: heat and moisture, producing putrid fermentation; for instance, in basement stories with damp under them, dry timber is but little better than wet, for if it is dry it will soon be wet; decay will only be delayed so long as the timbers are absorbing sufficient moisture, therefore every situation that admits moisture is the destruction of the timber."

The decay of timber in contact with stone is obviated by placing a thin piece of iron between the wood and stone. It is said that a hard crust is formed on the timbers in contact with the iron, which seems effectually to preserve it.

Fungi, it is said, will arise in mortar, if made with road-drift and water from stagnant ponds, &c., and that they may be traced through the mortar-joints, and will appear on both sides of a wall. Posts set in the ground in the direction in which they stood when growing are not so durable as when the position is reversed, and this is accounted for in the valves of the sap-vessels of the growing timber opening upwards; but when that position is inverted the valves of the sap-vessels become reversed in their action, and prevent the ascent of moisture from the ground. The author enters at length into the question of the proper time for felling timber, about which there is a difference of opinion, but "all investigations tend to prove that the only proper time for felling timber is that at which the tree contains the least sap. There are two seasons in each year when the vessels are filled. One is in spring, when the fluid is in motion to supply nutriment to the leaves, and deposit material for new wood; the other is in the early part of autumn, when, after the stagnation which gives the new wood time to dry and harden, it again flows, to make the vegetable deposits in the vessels of the wood. At neither of these times should trees be felled; for, if the pores be full of vegetable juices, which, being acted upon by heat and moisture, may ferment, the wood will decay."

This being an outline of the causes of decay, we come to the means of preventing it, or *seasoning*, which may be effected either by the natural methods of hot or cold air, fresh or salt water, vapour, smoke, steam, boiling, charring, or scorching; or by one of the patent processes, as Kyan's, Bethell's, Burnett's, Payne's, &c. Until wood has been properly seasoned it should not be painted, or coated in any way, for the paint prevents all evaporation, depriving the wood at the same time of the influence of the air, and the result of this is that the centre of the wood is transformed into touchwood. Logs should be seasoned before they are cut into planks and deals, otherwise they warp; on drying, more water escapes in one part than in another, and the contraction is unequal throughout the piece, causing twist; whereas the log being square it has no more tendency to warp in one direction than in any other.

"When a tree is felled, it encloses in its fibres, as well as in capillary channels, a considerable quantity of sap, which is nothing else but water charged with gummy, saccharine, saline, mucilaginous, and albuminous matters. In this state, the latter are very liable to ferment, but they lose their liability when, by the evaporation of the sap, they pass to a dry and solid state; so that the first suggestion which naturally presents itself to the mind is to subject the timber to a lengthened seasoning." But time will not always admit of this, and therefore artificial and speedy methods are resorted to.

When there is time for drying it gradually it should be piled up for two years for carpentry, and double that time for joinery. The sticks should be separated by blocks of wood, and each piece laid directly over the one under it, so that air may freely pass through the whole pile, and it is well to turn it now and then, as the evaporation is greatest on the upper side. The loss of weight, the author says, should be about one-fifth for carpentry purposes and one-third for joinery. But, however dry a stick of timber may be, it will be less dry in the centre than at the surface, and therefore the scantlings into which it is cut require further seasoning.

The plans of different Baltic modes of cutting deals for English and French markets are shown, and some useful information given about the qualities and properties of "strong" deals, best deals, "bests," "seconds," and "thirds."

Many houses in the suburbs of London, says the author, are erected by speculating builders. "Speculating builder" is the proper term, not "speculative," which is often used for the proper word. There is a difference. A speculative builder is he who intends to sell or let on lease a portion of his land to be built upon. A speculating builder is he who takes one or more lots of land for the purpose of running up houses and getting them off his hands as quickly as possible, before the woodwork begins to shrink, the plaster or stucco to fall off in patches, the foundation to settle unequally after a wet season, and such-like ugly signs of bad work. "Timber that has been lying for months in ponds or docks is sometimes cut up, and in six or seven days fixed in a building; consequently the usual result takes place, viz., dry-rot. After having been swelled by soaking much beyond its former bulk, the baulk of timber is put on the sawpit, and cut into scantlings, and framed while in this wet state." Timber should never be kept floating in ponds, partly under water and partly out, but it should be stacked, as at Liverpool and Gloucester.

We quite think with the author that "When there is not time for gradual drying, the best method, perhaps, that can be adopted, especially for sappy timber, and if strength is not principally required, is immediately on felling to immerse it in running water," but "it should be altogether under water (chained down beneath its surface), as partial immersion is very destructive;" and, "supposing in submerged timber the surrounding water to be flowing, or at least changing, this water will conclude by occupying, if not altogether, at least in a great degree, the place of the sap, which will have issued forth, carrying with it the fermenting principle with which it is charged."

But may there not be another reason for submerging timber? It has already been said that the intercellular spaces of the wood contain air. When it is placed wholly under water the air escapes from the intercellular spaces, and water takes its place—drives it out by the force of gravity, and this the more rapidly the deeper the submergence.

When the timber is taken out into the air the water evaporates, and if the air be dry the intercellular spaces will become filled with dry air; the original saturated air is replaced by dry air, which abstracts the remaining moisture from the woody fibre, and preserves it. If the scantlings into which the logs may be cut remain unpainted,

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* A Treatise on the Dry-Rot in Timber. By Thomas Allen Britton. London and New York: E. & F. N. Spon. 1875.

this moisture will also evaporate, and leave the wood thoroughly dry, and, presumably, not liable to decay if it be then painted to preserve it from external influences.

We recommend Mr. Britton's book to our readers.

THE ORIENTATION OF ANCIENT TEMPLES.

Captain Warren, R.E., has sent us a reprint of a paper read by him before the Royal Historical Society with this title. The subject, as appears from former papers published in the *Quarterly Statement* of the Palestine Exploration Fund, first attracted his attention while he was planning and sketching the temples in the Lebanon and Cœle Syria. The pamphlet embodies a good deal of subsequent research with his latest conclusions. He finds that worship, in early days, was generally towards the east, in groves and high places. This usage existed long before the prevalence of even the older forms of sun-worship. The source of light, the part of the heavens where daily rises the sun, became naturally the first *kibleh* of worshipping man. There every morning appeared a new Shekinah,—"the glory of the God of Israel came from the way of the East." The custom obtained among the faithful long after it had degenerated with the heathen into the worship of the sun and stars. But when the Israelites return from Egypt they abandon the practice of Abraham, and no longer turn to the east. The tabernacle first, and the temple afterwards, are placed with the doors of the Holy Place full upon the rising sun, so that the faces of the worshippers are turned away from it. It was not till 800 years later, viz., about B.C. 600, that the first signs of the heathen following this custom in like manner are observed. By the time of the destruction of Jerusalem, the worship had generally changed towards the west; in the development of Christianity the early members of the Church turned again to the east, and the ancient *kibleh*, with a new meaning, was re-established.

It is a pity that the argument of the pamphlet was not stated in the form of a preface, or pointed out by marginal notes. In so wide a field as Captain Warren's pages cover, it is difficult to avoid a feeling of vagueness unless the reader understands the author's drift. From Adam to our own time is a long road to travel.

The prominence of the figure of Abraham, not only in the Bible, but also in the Arabic literature, in Josephus, and the traditions of the people, is very striking. To him are attributed the altars, groves, and high places, in which he worshipped, face turned eastwards, where, according to Mohammedan story, he finally, after passing in review the sun, the planets, and the stars, chose their Creator for his Lord. He is said to have been the founder of the Kaaba at Mecca; he is said to have first consecrated the sacred stone of Mount Moriah, round which the world was built, by his readiness to sacrifice his son. His high places became the scene of idolatrous sacrifices, and his orientation degenerated into nature and sun worship. On the return of the Israelites they were told to pull down the high places. It is remarked by Captain Warren that they were not told to pull down the temples of Syria, *because there were none*. It is *after* the dedication of the Temple of Solomon that we hear of temples to Baal. It is not certain that the house pulled down by Samson was a temple at all. The ark, however, was placed in the house of Dagon, and Micah made a house for his gods. The story of Bel and the Dragon (about B.C. 600) contains an account of a temple which it is common to find corresponding, Captain Warren says, with those of later date examined by him in the Lebanon and about Hermon, especially as regards the secret chamber for the priests. "The account," he says, "is the more interesting because the earliest temples whose ruins are now extant are of about this date, and though they are unfortunately much ruined and altered, yet it is apparent, from what still remains, that they had their entrances to the west." The Parthenon, for instance, and the Temple of Jupiter Olympius at Athens, were so built. Captain Warren concludes that the building of temples in Syria grew up after the return from Egypt, and that no instance can be found of any temple with its entrance to the east earlier than 600 B.C., that is, about 400 years after the construction of Solomon's Temple. Vitruvius says (B.C. 25) that the entrances of temples should be towards the west, although in his time most temples must have had their entrances changed to the east. Certainly, in the existing remains of Syria, Greece, Italy, and Sicily, most entrances are turned toward the east. The temples round Hermon which had been thought to turn towards the mountain as to a kibleh, prove to be built in a direction a few degrees north or south of east, according, probably to the position of the sun at dawn on the day of dedication.

The synagogues of Galilee are different; their entrances face south, or towards Jerusalem. If, however, the Jewish use superseded the more ancient custom of orientation, how is it that the Christian returned to it at an early period?

"Some say it was a protest against the general worship of Jew and Gentile in their temples to the west, but here it is forgotten that the Christian religion did not overturn that of the Jews, but simply amplified and fulfilled it. Others say that the sun-worship having disappeared, with a few isolated exceptions, there was no reason why the Christians should not return to that kibleh from which the Jews had departed by way of protest, having, in its stead, the revealed glory in their temples. There is much reason in this argument, for the Shekinah had now left the Jewish temple. Others, again, say that it was simply to Jerusalem that Western Christians turn; and again, others that it was to the Garden of Eden, the Paradise in the East. It appears to me that a custom may obtain without any one very distinct or strong influence, if an infinite number of minor influences are brought to bear in one direction. For example: all early Christians, being Orientals, would, as we are aware, require a kibleh, but, being Jews, Gentiles, and Samaritans, they would all have had various opinions on the subject; is it not, then, possible that the kibleh to the east may have been that most agreeable or least disagreeable to the feelings of each individual of the congregation, while each would have a different reason for the choice; thus the custom may have arisen fortuitously? While putting forward this supposition, I do not, however, myself think that our kibleh arose in this manner. I am inclined to think that it sprang from the sentiments on the subject which seemed to pervade the human race when not ousted out by some enforced rite, and that it was particularly induced by the prophetic allusions to the Saviour of the World in the Old Testament, wherein the references to the east are most remarkable.

We have allusion to the glory of God coming by way of the east, and also the Prince by the east gate of the temple. He is called the Sun of Righteousness, the Morning Star, the Day-Spring from on high. How is it possible to examine these passages without instinctively feeling that the east has to us a charm over other quarters of the heavens, to which, even in our daily talk, we are ever unconsciously alluding? From the time when Elijah went eastward across Jordan to be caught up, until Our Saviour departed eastward past Olivet, we have continual reference to that as the special quarter of the heavens, and it should not therefore be surprising that we find the sentiment deeply engrained in the minds of all people.

Without this clue it would be most baffling and unsatisfactory to attempt to comprehend how the Christian writers could have got hold of the very sentiments common to the Egyptian and Greek heathen. We are told that, at Christian baptism in early times, the catechumens were obliged to stand facing the west and renounce Satan with gestures and outstretched hand, as though he were present—the west being the place of darkness and strength of Satan—and then to turn about to the east and make a covenant to the Sun of Righteousness, and promise to be His servant."

It is not apparent, from the appearance of this paper, that it is published for general circulation. We hope that Captain Warren will issue it for general reading, with such alterations in its arrangement as may seem fit to him. We have, for instance, noticed that perhaps his most important point, that in which he gives his reasons against Mr. Fergusson's restoration of the tabernacle, has nothing, or little, to do with his argument. Would it not have been well to make a special paper on this subject? We give Captain Warren's objections in full.

"In modern atlases and school-books we are accustomed to find the tabernacle represented as a modern European tent, of the description called marquee, such as is seen at a flower-show in this country.

This idea was first brought forward and developed about twenty years ago by Mr. Fergusson, and it has rapidly been taken up by the public, though I do not think that this representation to the eye of an Arab or Jew brought up in the East would call up any idea but that of the travelling tent of a rich Frank tourist. The oblong box-like structure shown in the works of Calmet, Bähr, and Newman is in all probability the real representation of the tabernacle, for it exactly corresponds to the description given in the Bible. Mr. Fergusson, however, ridicules this shape, appealing to our English prejudices, by suggesting its likeness to a coffin with a pall thrown over it; but he does not explain how the likeness to the modern coffin should be any objection to its use among a people living three thousand years ago, who used neither coffin nor pall, and whose eyes were entirely accustomed to a building of the general shape of our modern coffins.

As a matter of fact, the oblong box (call it coffin shape if it is preferred) was and is the shape of all the buildings in Egypt and the East generally, as far as India, of which proof can be found in the Biblical accounts, in Fergusson's 'Principles of Architecture,' and in modern photographs; and I ask Mr. Fergusson to produce a specimen of any early building from those countries, dating before our era, with a high-pitched roof, similar to that which he ascribes to the tabernacle,—even the Pyramids were built in a series of steps.

The tabernacle was reproduced in stone in the construction of the temple; but Mr. Fergusson does not attribute a high-pitched roof to that edifice. It is evident, however, that if there had been such a roof to the tabernacle we should have some trace of it in the form of the temple or in the architecture of the country. Instead of this there is only reference to flat roofs.

It may be said that the tabernacle was only a tent, but I contend that it was not a tent in our sense of the word. It was a wooden box-like building, with a leathern roof,—a wooden portable temple.

Admitting for one instant that it was a tent, I ask why it is necessary to give it a high-pitched roof, when Arab tents of the same size at the present day are nothing like a marquee. I have passed the night in Bedouin tents during heavy rains, whose roofs, of one thickness of camel hair, had a slope of not more than one in six, and they were comparatively dry inside; and I do not see any reason for supposing that the roof of the tabernacle was more than 1 ft. higher at the centre than at the sides.

Mr. Fergusson suggests that, with the box-like structure, the roof would sag in; but, in his construction, he is obliged to introduce a great many ridge-poles and uprights not mentioned in the Bible, with the use of half of which the box tabernacle would have its roof so held up as not to sag.

The high-pitched roof introduces a grave difficulty; the upper part is open from east to west, and the wind would have raised the roof and blown the tent down with facility. Again, the Holy of Holies is left without any roof except the angular one of the tent; it thus ceases to be a *cube*, and it is open to the light and air to the west, so that any person on an elevation to the west could see into it. Such a construction is entirely contrary to the Biblical account, where the entire seclusion of the sanctum is enlarged upon, and the interior spoken of as 'thick darkness.'"

SUBURBAN BUILDINGS.

HACKNEY.

Hackney has been alluded to before now in these pages in some of its social and sanitary aspects, and with, we hope, some good effect; but the abuses are manifold which still need to be combated, and the necessary reforms are not a few.

On the surface, from a health-giving point of view, the Eastern or North-Eastern district can, perhaps, justly boast of more "open spaces" than any other district in the metropolis; and lucky indeed for Hackney is the circumstance, as will be seen hereafter. These open spaces comprise Victoria Park, Hackney Common alongside, the Downs, acting as a useful lung for Kingsland, Dalston, and Clapton; "London Fields," a smaller open space, but still existing, with a salutary effect for portions of Hackney and Shoreditch; and, further off, the Hackney Marshes, through which runs the River Lea. The latter open space, notwithstanding its low position, is of an incalculable benefit to the parish, from either a recreative, sanitary, or other aspect. The Marshes, once distant, have their borders now encroached upon by bricks and mortar. The Marshes proper still exist almost intact, but acres of the original Marsh land, forming the boundary or approaches on one side, have been filched by degrees and built upon. Through a portion of this border-land, a parish sewer, extending from Hackney Wick to Lea Bridge, the want of which we pointed out some years ago, was lately constructed. The sewer absorbs a former open sewer, or foul stream, which had been for several years a great nuisance. Its covering in and connexion now with the main outfall affords relief, and gives an opportunity for house-drainage where none previously existed, except in make-believe. The great defect of the new sewer, which has cost several thousands, is, that its fall is insufficient, and in times of flood the houses in the low-lying district in the vicinity are in danger of being inundated. The workmanship of this sewer is on a par with other parish contracts: it alternates bad and good in forma-

tion and materials. We more particularly allude to the last and largest executed portion, which runs through a very soft bottom, and which needed a uniform adherence to the same materials and finish, and not a change in the nature of the bricks, and the absence of a backing of concrete on the outside in places. If the specifications were followed, the contractor has nothing to answer for; our object in taking note of the matter, among others that will follow, is purely a sanitary one.

It is an easy transition in subject from public sewers to house-drains, and in the matter of the latter and that of "shoots" this large parish is veritably sepulchred. Suburban and semi-suburban parishes in the London metropolis have fared ill during the last quarter of a century; but Hackney, from the fact of having possessed a rich sandy and gravelly soil, has been "sat upon" for years by a tribe of building locusts. We say from positive knowledge and careful personal examination of hundreds of houses and places throughout the district, that the house drainage of two-thirds of them is improperly executed. It would be an oft-repeated tale to say that the houses were "built to sell," but we could prove to a letter that their building and sale were in many cases little better than a swindle. Nearly the whole of the recently-erected streets of houses in the district of Homerton were "run up," as the phrase goes, by speculative builders, with the aid of money advances, money borrowed, or by the aid of a little profit in hand from previous building speculations, supplemented by credit on the part of those supplying materials, who were content to await payment from the speculator according as he sold his genteel dwellings. The materials of these dwellings are of the cheapest and worst possible kind. The bearing timbers, such as the roof rafters, joists, partitions, all that constitutes the hidden timber of the structure, are green, sappy, and so thin and weak in scantling as to be unfitted for the purpose. The bricks are of the most inferior quality, and, save only those which constitute the front or exposed parts, are utterly bad and worthless. The interior walls are mostly of the bricks of old houses bought at sales in the City, where fever "rookeries" have been tumbled to make way for some of our doubtful City improvements. Throughout portions of Hackney, South and West, similar materials are duly worked up as those we have described in relation to the poorer districts of Homerton and Hackney Wick. Streets of houses have been erected in several places on veritable "shoots" freshly formed, and in the same neighbourhood scores of other dwellings had the ground between their walls dug out to depths ranging from 8 ft. to 10 ft. or more, the solid sand and gravel removed, and the parish ashes and road-sweepings, with other vile rubbish, animal and vegetable, shot down. At one particular spot here, a row of houses was commenced on a fresh steaming "shoot," while the remainder of the shoot land intended to be built upon was in process of filling-up. So fast, indeed, were the houses run up here, that the dustmen and scavengers were scarcely able to keep in advance of the speculative builder in filling up the foundations. On this soft and yielding bottom dozens of houses were erected, and the process of putting in the footings might be compared to that of a hen scratching a slight hollow or nest in the road to lay in. The houses of course exist now in their supposed finished condition, with a mutual dependence on one another,—"together they stand and together they'll fall." What a harvest of illness and mortality will not these dwellings produce, with floors over and upon from 6 ft. to 8 ft. or more of scavenge, old rotten timber, in some instances, as joisting, and, where new, scarcely 3 in. deep, supported in the centre here and there by loose bricks, instead of dwarf walls, or, perhaps, as occasion offered, a sole-piece of old timber laid down, that could not be utilised for other purposes. The drainage, like the brickwork, and other work of these houses, was scamped, and the small number of drain-pipes we saw used were laid in in the most indifferent manner. Little attention was paid to their joints, connexions, or whether they drained backward or forward, had their outfall into a regular sewer, or pleased themselves by allowing their matter to be absorbed by mother earth.

In South Hackney, on the borders of Victoria Park, we visited recently a few rows of ambitious three-story genteel houses, intended for a more well-to-do class of tenants than those previously described. We paid frequent visits here from the time the first houses were commenced, and what we describe we witnessed. The ground of the houses here, facing both divisions of the Park, was dug out from 6 ft. to 8 ft., and in some places to 12 ft., and the natural soil, sand and gravel, removed. A large quantity of this sand and the heavier shingle was sold and carted away to other parts of the parish and City, and the excavation between the walls of the houses was filled up with loose ashes and rubbish. The space forming the roadway without was also excavated to a great depth, and the most filthy and composite matter was shot down in this space, and was continued, with slight exceptions, "all along the line" in front of these "most respectable and genteel houses." We witnessed here something novel in the matter thrown into the shoots. Besides the dregs of every refuse that can be well thought of, we saw here human as well as animal bones shot down, supposed to be carted from some of the dug-out yards of the condemned City churches. To place all matter beyond dispute as to the identity of human bones, let us state that we looked upon a human skull resting with other bones among the *débris*. This object soon attracted the attention of a few passers-by, and some of the workmen took speedy means for covering it from further public view.

If building scandals are to be put a stop to, the best way to pave the way for the action of the law, is to state plain and undeniable facts. This we are doing, and we do not challenge contradiction, but we challenge substantial disproof. In a recently-erected street of houses, not far from High-street, Homerton, we witnessed the whole length of the row of houses excavated from depths varying from 12 ft. to 16 ft., and the elongated quarry from which the sand and shingle were dug to be sold, filled up with all sorts of reeking and abominable rubbish. The local authorities knew of it, but never seemed to move in the matter. The foundation, construction, and materials of these houses were similar to those in the case first described, and the speculation was almost identical. Off the main thoroughfare of Hackney proper, within the throw of a stone of the Town-hall, a similar street of dwellings was erected. The sand was dug out, and the ashes and parish rubbish were thrown in for the foundations of the houses and pretty back gardens. At Graham-road the sand was dug out, and is still being dug out, and the pits were filled up in contemplation of future building operations. At Defoe-road, Stoke Newington, and other places between Kingsland, Dalston, and Hackney proper, eligible sites are being prepared for, and similar buildings are in course of erection. This system of building has been rife for several years past, and we might point out more instances as bad as those named, within sight of the head quarters of the parochial rulers, some of whom had a direct or indirect interest, in one form or another, in the prosecution of these building projects. During the present year has been erected, and a few weeks ago opened, a new School Board School, built on a monster shoot of some acres in extent, alongside of which runs a foul open sewer. This "shoot" is the property of the District Board of Works, and is utilised by them. Every Sunday morning this "shoot," at a spot immediately under the walls of the schools, has been and is still used for the purpose of an "Aunt Sally" exhibition; and here the Sabbath is desecrated by hundreds of roughs and rowdies, shying with clubs at cocoa-nuts perched upon sticks. The noise and language of the rabble may be imagined. The erection of a new School Board School on this "eligible site" has been a signal to recommence operations, and accordingly the usual class of flimsy structures are being run up alongside the school, to be continued, most likely, till the entire available space on this monster shoot is absorbed. We were asked a few days since to examine the condition of some houses in the South Hackney district, not far from the church. The houses, externally and internally, in design and finish are, to use a common phrase, "one sack, one sample," in fact, several roads and streets of houses are of the speculative class, and are not owned by the original builders or owners. Of those we examined we found the drainage generally bad, and smells offensively apparent. In fact, bad house-drainage is a characteristic of the district. Under the ground-floors we could run down the handle of a sweeping-brush with facility to any length to its complete disappearance. The sand here, of course, had been dug out, and the bottoms answered for the purpose of a shoot. The joists of the ground-floors (there were no under-kitchens) were scarcely 3 in. deep, and less than half that in thickness. There were no dwarf walls in the centre, with sleepers for the joists to bear upon, but loosely-piled blocks of bricks were raised at intervals in the centre, on which, in some instances rested transversely a piece of scantling, to give support to the flooring. The hearth-stones were 1 in. thick, of some soft freestone, and they rested on a bed of rubbishy mortar, having no cohesion, the said bed of mortar, of course, resting on the aforesaid deep body of made-up rubbish. In several instances we found offensive smells, and in other instances dampness and dry-rot, the fungi actually making its appearance in the fireless parlours, between the hearth-stones and the ends of the abutting flooring-boards. We found carpets damp and rotting away on the said parlour-floors, and the landlord of some of these houses is, if we are informed aright, a member of one of the local boards which grace the Parliamentary borough of Hackney. The doors and window-sashes of these genteel houses are of the poorest description, and nearly all the door-frames have sunk on one side, exhibiting the usual gaping results between the doors and their rebates on sides and top. These houses, where they are not owned by the tenants, are let on repairing leases by their landlords, and where owned by the tenants there are smart ground-rents to pay, in addition to keeping them in in repair,—a never-ending task.

We examined some more houses in a road approaching the last-named church,—a road accounted the most respectable and aristocratic one in the district. The houses here have been longer built, are externally more pretentious, and letting at higher rents. The basement rooms here in front are the breakfast parlours, and on raising the flooring-boards we found similar filling stuff underneath, as described elsewhere. The drains run under the houses from rear to front, the sewer gas is always escaping, and the rats have regular galleries in the loose rubbish under the floors. In fact, the bottoms are regularly honey-combed, and colonies of rats, young and old, hold day and night grand carnival beneath the floors of these locally aristocratic residences.

A few remarks about the parish itself and its rulers may not be amiss as a wind up to our brief survey. In the matter of parochial or local government Hackney occupies a most anomalous position. The spirit and letter of the Municipal Corporation Reform Act seem to have left Hackney unbreathed upon. Exclusive of a Poor-law Guardian Board, Hackney is mal-administered by a tripartite system of ruling bodies. These comprise a Vestry, a Trustee Board, and a District Board of Works, the members in many instances being common to each. The District Board of Works, which is the administrative body, is elected by the Vestry, the only real business it transacts; but even the Board is not constitutionally representative, as some defects in the elective system show. The Vestry is the only body of the three elected by the ratepayers, and yet, strange to say, it has not the power of paying its own bills under the tripartite system in vogue. What are we to think of a vestry or local board elected by the ratepayers having to pass over its accounts or bills to another body? Again, while the valuation of the district is in the hands of the District Board, the Assessment Committee is chosen from the guardians, a body which every one believes is elected solely for poor-law purposes. This arrangement, of course, causes the greatest confusion, shifts responsibility, and gives rise to numerous abuses. The Trustee Board is an absolute sham in its constitution, "a mockery, a delusion, and a snare," and the marvel is that the Local Government Board has not taken some steps long since, acting under instructions from the Home Office, and snuffed out at once and for ever such a self-constituted body as is the Trustee Board. It is not in any sense a representative board or body, but under conditions it may be stated to be a life and self-elected body. It is not our purpose here to give a picture or pictures of the fencing and financing antics of the three boards that constitute the tripartite system of parochial misrule in the borough of Hackney. We incidentally point to the indefensible anomalies existing in the local government of the parish, as it will afford a side-light to the pictures we have already drawn. Under such a system, dirt, disease, and a heavy death-rate must continue to exist in this unfortunate parish.

There is an ecclesiastical vestry in Hackney,

we should have added, as well as the civil vestry, and through it the numerous charities belonging to the parish are administered. These trusts for long years have been managed and administered in a hugger-mugger manner, and call for a Government inquiry. For years past the charities have largely increased in value, but the local public are afforded no satisfactory account of their management. A new scheme for their proper control and distribution is imperatively needed, and, indeed, is demanded by the parishioners. Hackney has two able Parliamentary representatives, and, apart from the special political questions they are respectively noted for advocating, they will find ample scope for their talents for years to come in moving in the parochial reforms needed to lift the local and administrative rule of this borough from a region of eclipse into a region of light.

INSTITUTION OF SURVEYORS.

The opening meeting of this Institution for Session 1875–76 was held at the Hall, 11, Great George-street, on Monday evening, the 8th inst., the President, Mr. Thomas Huskinson, in the chair. The following candidates were passed for ballot: as Member, Mr. W. D. Harding, 16, St. Paul's-churchyard. As Associates: Mr. John E. Kay, 25, Gresham-street; Mr. H. Nevill, 6, Queen Anne's-gate; the Hon. E. G. Strutt, Witham, Essex; Mr. J. L. Bolden, Camborne, Cornwall; Mr. J. W. Batten, 3, Harcourt-buildings, Temple; Mr. W. H. Higgin, Q.C., Manchester; and Mr. C. M. Lanyon, Tanfield-court, Temple. The Secretary (Mr. J. W. Penfold) announced that the Council had passed Mr. E. W. Rushworth, of 22, Savile-row, from the class of Associates to that of Members. Several donations to the library were announced, including a series of sketches of some old houses in Lime-street (lately demolished) presented by Mr. T. Chatfeild Clarke.

The President then proceeded to deliver his opening address. He said he was glad to be able to state that at no past period of the existence of the Institution could a more satisfactory account be given than at the present time. The past year might be described as one full of activity and gratifying prosperity. There was a considerable increase in the number of members; important additions had been made to the contents of the library; there was an increased prosperity in the finances of the Institute; and the new and commodious meeting-room had been completed. The published volume of the Transactions of the past year contained a vast mass of practical information in the papers and discussions thereon. Looking back to the objects which the founders of the Institution had in view, it was matter for congratulation that a great part of the programme had been accomplished, and if the members continued to be as true to the Institution in future as they had been in the past, a great and useful career was before them. The duties which devolved upon surveyors were growing every year in number, variety, and importance. The tendency of the times was to increase the already large class of business which was settled by arbitration, and to the body of arbitrators the Institute furnished some experienced members. Even the decision of that time-honoured institution, the jury, was less valued, in many cases, than the judgment of a skilled and impartial arbitrator; and in the fusion of the courts of law and equity we might observe the same tendency to prefer the settlement of disputes on the principles of equity rather than on technical principles of law. The progress of science, increase of wealth, the development of material resources, and the spirit of improvement, were every day making larger demands on the skill of the surveyor. A man fitted effectively to discharge the duties of the surveyor should be one of wide experience, large and cultivated knowledge, skilful in the conduct of business, and ready for every emergency. He should in negotiations be flexible and accommodating in small things, but very rigid and inflexible in great matters; and, as arbitrator, he should be one whom nobody could dismay, and whom the whole world could not bribe. Above all, he should be possessed of that moral power which gave to every other a double power above its function and office: one who, in the words of the Roman poet,

> "Keeps intact
> Each law, each right, each statute, and each act;
> Whose arbitration terminates dispute,
> Whose word's a bond, whose witness ends a suit."

It was one of the objects of the Institution of Surveyors to be instrumental in training a body of men to whom the public could commit the most important interests with the utmost confidence. Passing in review the legislation of last session, which more immediately affected the profession, Mr. Huskinson first noticed the Agricultural Holdings Act: viewing the Act as a whole, it appeared to him to have dealt with the relations of landlord and tenant in a spirit of justice, without any unfair leaning towards the special interests of either. There was one point in connexion with the passing of the Land Act of 1875 which was a source of gratification, viz., the manner in which the legislature, when the question came before it to be practically dealt with, entirely ignored the theorists, doctrinaires, and philosophers. Referring to the characteristics of British agriculture, as compared with those of the agriculture of the Continent, he said that during the past year he had again visited France, Germany, and the Tyrol, and was more than ever convinced of the superiority of the English as agriculturists. Looked at from a purely economical point of view, Continental farming seemed to reproduce and even to exaggerate the evils with which all who remembered the old open field parishes in England were familiar. He saw the same congregation of the buildings in villages; the same small farms composed of widely-dispersed parcels, the parcels themselves being so small as scarcely to justify the application of horse-power for their cultivation. But looked at from another point of view, and for a moment neglecting economical considerations, there was ample evidence to show that the personal condition of the small proprietor, his wife and children, was far inferior to that of the English labourer and his family. To say nothing on the question of food, clothing, and house accommodation (though upon these points, as was well known, the position of the English labourer need fear no comparison with that of the cultivators of a large part of the Continent), there were two facts which would serve to establish the inferiority of foreign agriculture. Firstly, there was the great amount of female and juvenile labour employed on the land; and secondly, there was the character of the work which they had to perform. The general employment of female labour in agriculture showed a great want of outlet for females in occupations more suited to their sex; and the necessities of the small peasant-farmer required women to perform such work as in England no woman would undertake, and which would, indeed, be done by horses. The hardships and labours which they underwent would scarcely be credited by the English labouring population, and it was only by incredible exertions, and by employing women in work utterly unsuited to them, that peasant-farming could show the results it did. In England, horse-power and machinery tended to supplant manual labour, and man, ceasing to be a mere machine, was becoming every day more and more a director of work. This, surely, was progress for humanity. No doubt the independence of the peasant-proprietor was a very pleasant idea; but did not the progress of society in all other arts imply to some extent a loss of independence? Then why should it not be so in agriculture? The Act next in importance to the public, as well as to the profession, was the Public Health Act, which was a very comprehensive and useful measure, and was in great part a consolidation of the many Acts passed since 1848 to improve the sanitary condition of the country. Previously to the passing of the Public Health Act of 1875 it was true that, in rural districts, it would have been difficult to have pointed out a single nuisance that could not be removed, or a defect in the sanitary condition of a village which could not be remedied, under the provisions of the several Acts passed from 1848 and 1875. Ample powers were given to remove nuisances, to give efficient drainage, to dispose of sewage, and to supply water; but he (Mr. Huskinson) did not know any village where any of these advantages had been attained under those powers. The state of things in many rural districts could not well have been worse than it was before the passing of the Public Health Act. In some villages owned by large proprietors, attention was given to sanitary matters, and care was taken to avoid nuisances and conditions hurtful to health; but this applied to only a small proportion of the whole. For the most part our agricultural villages were (and are now) without house drainage or street sewers; they had open cesspools, ill-built privies, pigs in close proximity to the dwellings, offensive and uncovered ditches, and were very badly supplied with water. The causes of the failure of existing legislation to remedy these evils appeared to be two. Firstly, there was no authority,—no person or public body,—upon whom it was imperative to put the law in force: the Acts were all more or less permissive. Secondly, when there were persons who wished to put the law in force, there was so much doubt and confusion arising from the language of the Acts that no one could tell who was the proper authority to enforce them, or what was the scope of their power. Considering how imperfectly people appreciate the benefit of good sanitary arrangements, it was no wonder that they declined to act where there was no legal obligation. Passing on to another topic, Mr. Huskinson said that the supply of water to rural districts was a most pressing question. It would be comparatively easy, by the co-operation of parishes, and without any great cost, to store up our surplus rainfall of one season for use at a future period. No doubt the members had read the letters on the subject which had appeared in the *Times* from the pens of Mr. Bailey Denton and Mr. Grantham. In this matter of supplying agricultural villages with water we were immeasurably behind Continental nations. Referring to the Artisans' Dwellings Act, Mr. Huskinson said it gave very extensive powers for the purchase of private property, and its operation would, he had no doubt, receive the careful attention of those members of the Institution who would be called upon to carry it out. Passing from the legislation of the past session, he suggested, for the consideration of the members, whether some legislation in the future was not desirable in the direction of really local self-government, for he believed that it was the want of this in rural districts which had been the cause of the failure of sanitary legislation during the past twenty years. He could not but think that it would be feasible to have a local authority constituted in each parish, and capable of dealing with the affairs of the parish. At present much of the so-called local self-government was a delusion. In matters relating to the poor, highways, and the public health, the local authority was in no sense local. The Public Health Act of 1875 appointed the Board of Guardians as the local authority under the Act, the officers under them being a medical officer and an inspector of nuisances. These officers were theoretically supposed to be acquainted with the nuisances and requirements of perhaps twenty or thirty, or more parishes. It appeared to him (Mr. Huskinson) that the rural authority for sanitary purposes should be really local, *i.e.*, it should consist of men residing in the parish. A thorough reorganisation of rural sanitary authorities was greatly to be desired, and a writer in the *Times* for August 25 last, reviewing the Public Health Act, stated it as his opinion that without such reorganisation no sanitary law would ever be effectually administered. In that opinion Mr. Huskinson said he entirely concurred. Without committing himself in any way to approval of the general tendency of Mr. Goschen's Local Government Bill, there was one point in it which appeared to him to be of great value, and which, he hoped, would be incorporated in any future Local Government Act. He alluded to the proposed reconstruction of the parish or township as the unit for all administrative purposes. In conclusion, Mr. Huskinson urged upon the members the necessity of their keeping a watchful eye upon the working of existing legislation, and also upon all measures introduced into Parliament.

On the motion of Mr. Vigers, seconded by Mr. Squarey, the thanks of the meeting were tendered to the president for his address.

The following are among the subjects announced for papers during the session just inaugurated: "Fruit Lands"; "Rural Water Supply"; "The Management and Maintenance of Fences and Hedgerows"; "Riparian Rights"; "Light and Air"; "Sanitary Laws"; "The Construction and Rearrangement of Farm Buildings"; and "Warping and Reclamation of Waste Lands."

The next meeting will be held on Monday, the 22nd inst. when a paper on "Fruit Cultivation and Management" will be read by Mr. George Webb.

Registration of Trade Marks.—A paper on this subject will be read before the Society of Arts, by Mr. H. Trueman Wood, on Nov. 24. Mr. A. J. Mundella, M.P., will take the chair.

ARCHITECTURAL ASSOCIATION.

At the first ordinary general meeting of this Association for session 1875-76, held on the 5th inst., as already mentioned, the following new members were elected, viz.:—

Messrs. A. Frampton, J. C. Dear, R. G. Davis, F. Buckler, M. H. Pocock, L. V. Reich, W. T. L. Tomlinson, R. E. Crossland, L. A. Stokes, H. W. Phillips, E. A. Boissier, C. Dark, J. C. Moncrieff, J. M. Maclaren, G. H. F. Prigune, C. E. Sayer, L. B. Brown, H. H. Law, H. J. Burnett, H. H. Freeman, F. Howse, E. Avern, B. Everest, B. C. Capell, R. Wood, H. Branch, H. M. Gardner, T. Newell, W. B. Tomlinson, S. F. Williams, J. Clifton, W. W. K. Clarke, G. Ealce, G. E. Grayson, C. King, E. Hewetson, F. Y. Robinson, L. F. Dove, A. Hill, H. M. Robinson, F. A. Smith, P. Currey, E. J. Drew, C. W. Harvey, H. W. Townsend, J. Robbins, J. B. Hind, W. Goldsmith, S. Wyborn, and W. G. Flint.

The meeting proceeded to consider the various reports of the Association and its classes.

The annual report, after enumerating the papers read during the past session, acknowledged the receipt of donations to the prize fund from Messrs. S. E. Barnes, G. H. Birch, J. H. Good, J. D. Mathews, and H. S. Snell. The classes had flourished during the past session, and the work submitted by the members showed their desire to avail themselves of the opportunities afforded for increasing their artistic and practical knowledge. The two Classes of Design and the Class of Construction commenced with large numbers of members, and the average attendance was good. The Colour Decoration class was also well attended, and a very high average of sketches submitted. The new class for the study of Architectural Science was very successful: this class was formed last session to enable members to study the more advanced problems in construction, together with such subjects as acoustics, heating, ventilation, &c. The class for the study of Surveying and Levelling was held last session with a larger number of members than usual. Interesting old buildings and buildings in progress were visited on alternate Saturday afternoons from January until the end of the session. The arrangements recently made to enable country members to participate in the advantages offered by the Association have been in active and satisfactory operation during the past session. The report, which closes by calling attention to the work of the session, was unanimously adopted.

Mr. J. Douglass Mathews, treasurer, next submitted his balance-sheet for the past session, audited by Messrs. Charles G. Maylard and Alfred Conder. It showed the total receipts to have been 482*l.* 0s. 6d., including 324*l.* 8s. for members' subscriptions, and 50*l.* 18s. 6d. for entrance-fees of new members. The total expenditure amounted to 471*l.* 7s. 3d., two principal items being rent 93*l.*, and grant to library 30*l.*, there being a balance in the treasurer's hands of 10*l.* 13s. 3d. The assets (including arrears of members' subscriptions, estimated at 140*l.*, and estimated value of library, furniture, &c., 410*l.*) are put down at 578*l.* 7s. 6d., with liabilities of only 47*l.* On the motion of Mr. Mathews, the report was unanimously adopted, and a vote of thanks accorded to the auditors.

The report of the Library Sub-Committee, read by Mr. W. L. Spiers, librarian for the past session, showed that the number of books exchanged was 1,360, as against 1,200 in the previous session.

The reports of the various classes were next received and adopted, and all, as stated in the report of the Association, indicated much useful work, although we have not space for the statistics of each class. The report of the class for the study of colour-decoration expressed its indebtedness for many useful hints given by Mr. Walter Crane; and also to the Royal Institute of British Architects for kindly permitting the members of the class to have access to the Library every evening when open.

A vote of thanks was accorded by acclamation to Mr. Edmund Sharpe for his services in connexion with the Association's excursion, and the President then proceeded to deliver his opening address, the substance of which we have already published.

Liverpool Art Club.—The exhibition of works of David Cox is now open. A *conversazione* was held in the rooms on Monday evening last.

THE MANORA BREAKWATER AT KURRACHEE.

THE INSTITUTION OF CIVIL ENGINEERS.

At the first meeting of the session, held on the 9th of November, Mr. Thomas E. Harrison, the president, in the chair, the paper read was on "The Manora Breakwater, Kurrachee," by Mr. William Henry Price, C.E.

It was stated that the Manora Breakwater was the most important feature of the Kurrachee Harbour Works, which were commenced in 1860, from the designs of the late Mr. James Walker, assisted by Mr. William Parkes. The breakwater projected from Manora Point for a length of 1,503 feet into a depth of 5 fathoms of water, in order to shelter the entrance from the south-west monsoon seas, and to prevent their tearing up sand from the bottom, and depositing it as a bar. The characteristics of the sea, wind, and tides, as bearing on the design, were alluded to, and it was stated that the bottom was irregular near the shore. The structure consisted of a base of rubble stone levelled off generally to 15 ft. under low water, and on this base, concrete blocks, each weighing 27 tons, were set on edge, leaning back at a slope of 3 in. to 1 ft., and without bond, two blocks forming the width and three the height, and together making a square of 24 ft. in cross sections, the top being about the level of high water. The rubble base was deposited from native boats, and was levelled for the superstructure by helmet-divers. Two European mason-divers were employed, and six native divers trained on the work, the latter chiefly for shifting the rubble. No accident occurred, and the party generally did not suffer in health. After mentioning circumstances which determined the use of concrete blocks and of Portland cement, particulars were given of the composition of a 27-ton block, the materials being cement, river-sand, shingle, and quarry-lumps, with salt water. The ratio of the bulk of the cement to that of the finished block was nearly 1-11th. About 3,500 tons of cement were used, costing from 3*l.* 17s. to 4*l.* 10s. per ton. The mixing-station, block-ground, and moulding of the 1,972 blocks, including 325 of special smaller sizes, were then described; and it was remarked that the "Messent" mixers had been found very efficient. The blocks were sometimes used one month after being made, and once, as an experiment, a 27-ton block was safely lifted in seven days. When the work was fairly established, the blocks cost for current expenses 15s. per cubic yard, though the average total rate was raised beyond this by extra expenses in the earlier stages. The blocks were lifted on to the trucks by a steam hydraulic travelling-crane of 50-ft. span; each truck carried one block, and was taken separately by a tank locomotive to the breakwater. The blocks were set by a steam travelling-crane, called the "Titan," which ran on rails laid on the finished work, and overhung the end, so as to carry the blocks of three tiers in advance to their places, thus dispensing with staging.

The cost of the breakwater had been 93,565*l.*, or 62*l.* 5s. per lineal foot, but this amount included preliminary charges, the current expenses during the last season being only 34*l.* per foot. This sum included the repair of damages during the progress of the work, and during the two monsoons since its completion, but not the expense of engineering and office establishment. The work had been carried on in the Bombay Public Works Department by the author and his assistants, advised by Mr. William Parkes, C.E., as consulting engineer, and without the employment of any general contractor. The completion of the work was favourably noticed by all the Government authorities concerned.

BEAUTY NOT INCOMPATIBLE WITH ENGINEERING CONSTRUCTION.

In delivering his introductory lecture to the Engineering Class of the University of Edinburgh, on the 1st inst., Professor Fleeming Jenkin took occasion, after first noticing that it was only the theory, and not the practical knowledge of engineering that could be acquired in classes, to warn young engineers against trying to design some great work all out of their own heads. The Greek and Roman builders had, he remarked, been content each to take the level of his predecessor's attainments, and to improve upon it, and the same thing had been done in the case of the locomotive engine and other machines; while, on the other hand, if every inventor had endeavoured to design an engine of a new sort all out of his own head, machines would probably have been as great failures as buildings now were. Passing next to touch upon the assumption which, he said, was at present popular, that it was inevitable that a viaduct or bridge of any kind must be a disfigurement to a landscape, the Professor pointed out that such erections as the viaducts of the Campagna and the bridge of the Rialto might be cited to prove the very opposite, although he, at the same time, admitted that in some respects the assumption was too well founded, it being a common thing now to see their Highland valleys defiled by sky-blue girders, only rendered more offensive when any attempt was made to plaster them with ornament. Alluding to the churches built after the Disruption,—buildings of such ugliness that the power to produce them could only have been found in some very gifted age,—as the kind of erections which engineers would have been expected to produce had they dealt with churches, he urged those among the class who had any artistic taste to cultivate it to the utmost. One result of their total neglect of beauty in the past was that the public had ceased to think of a pleasing form as a necessary quality of an engineer's design.

NEW SECRETARIAT, BOMBAY.

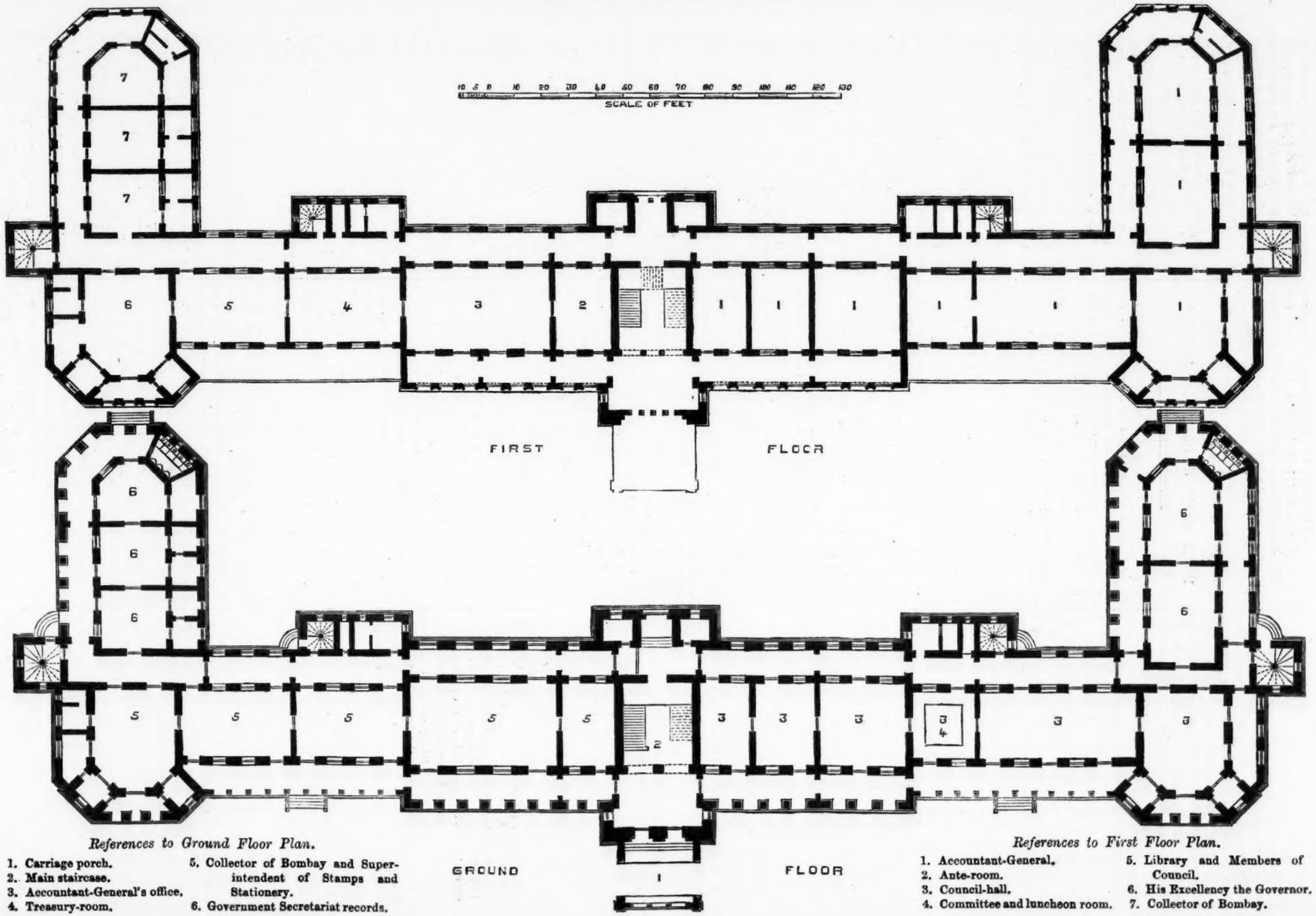
The visit paid by H.R.H. the Prince of Wales to Bombay has naturally directed public attention to that typical Indian city, and our readers may be glad to know something of the public buildings recently erected there. We illustrate, therefore, in our present Number, with the sanction of the Government, the New Secretariat. This building, situated on the Esplanade facing Back's Bay, was designed by Colonel St. Clair Wilkins, Royal (late Bombay) Engineers. The walls are built of blue basalt rubble masonry, faced with roughly-dressed Coorla (buff colour) basalt, in about 7 in. to 8 in. courses, no stone being less in length than twice its depth. The dressings are in calcareous sandstone, obtained from Porebunder, in Kattiawar, in Coorla buff basalt, local blue basalt, and Poona red basalt. The corridor columns are in either Coorla buff basalt, blue basalt, or a silicious sandstone from Hemmygur, in Kattiawar. The corridor and window arches are composed of Porebunder stone and blue basalt, or red basalt from Poona, set alternately. The grand staircase, 8 ft. clear in width, is of blue basalt, obtained in the Island of Bombay, each step being in a single stone, let 18 in. to 2 ft. into the wall, and from the nature of its construction self-supporting. The roof is covered with the Broomhall Tile and Brick Company's patent roofing tiles, over teak, ¾ in. planking, and teak framing. The ground-floor is paved with fine-cut basalt, except the staircase vestibule, which, together with all the other floors, are paved with Minton's tiles. The floors, in matter of construction, consist of iron girders, teak joists, with short planks, on fillets between the latter, to receive concrete sounding under the tiles, and in some rooms Porebunder slabs are placed over joists to receive the concrete.

The building was erected Departmentally, on the petty contract system, under the immediate superintendence of Mr. Wassoodeo Bappoojee, assistant engineer, and has cost 11d. per cubic foot (cubical contents above ground being alone taken). The council-hall and suite of rooms in connexion therewith are furnished with Gothic teak furniture, inlaid with blackwood, from designs by Mr. J. Adams, assistant engineer, and locally manufactured.

The plans we give show the accommodation on the ground floor and first floor. Beyond this, the second floor contains military, marine, and ecclesiastical departments of the Secretariat; Secretariat printing-office; Sanitary Commissioner; and revenue, finance, and general department of the Secretariat. The third floor, resident under-secretary's quarters; those for the collector of salt revenue; political, judicial, legislative, and educational departments of the Secretariat; and office for the Oriental translator to Government.

Appointment of Architects to School Boards.—At a meeting of the Rochester School Board on the 4th inst., Mr. Walker was appointed architect to the Board; and at the first meeting of the Worsbro' School Board, held on the same date, Messrs. Taylor & Senior were unanimously elected architects to that Board.

NEW SECRETARIAT, BOMBAY.

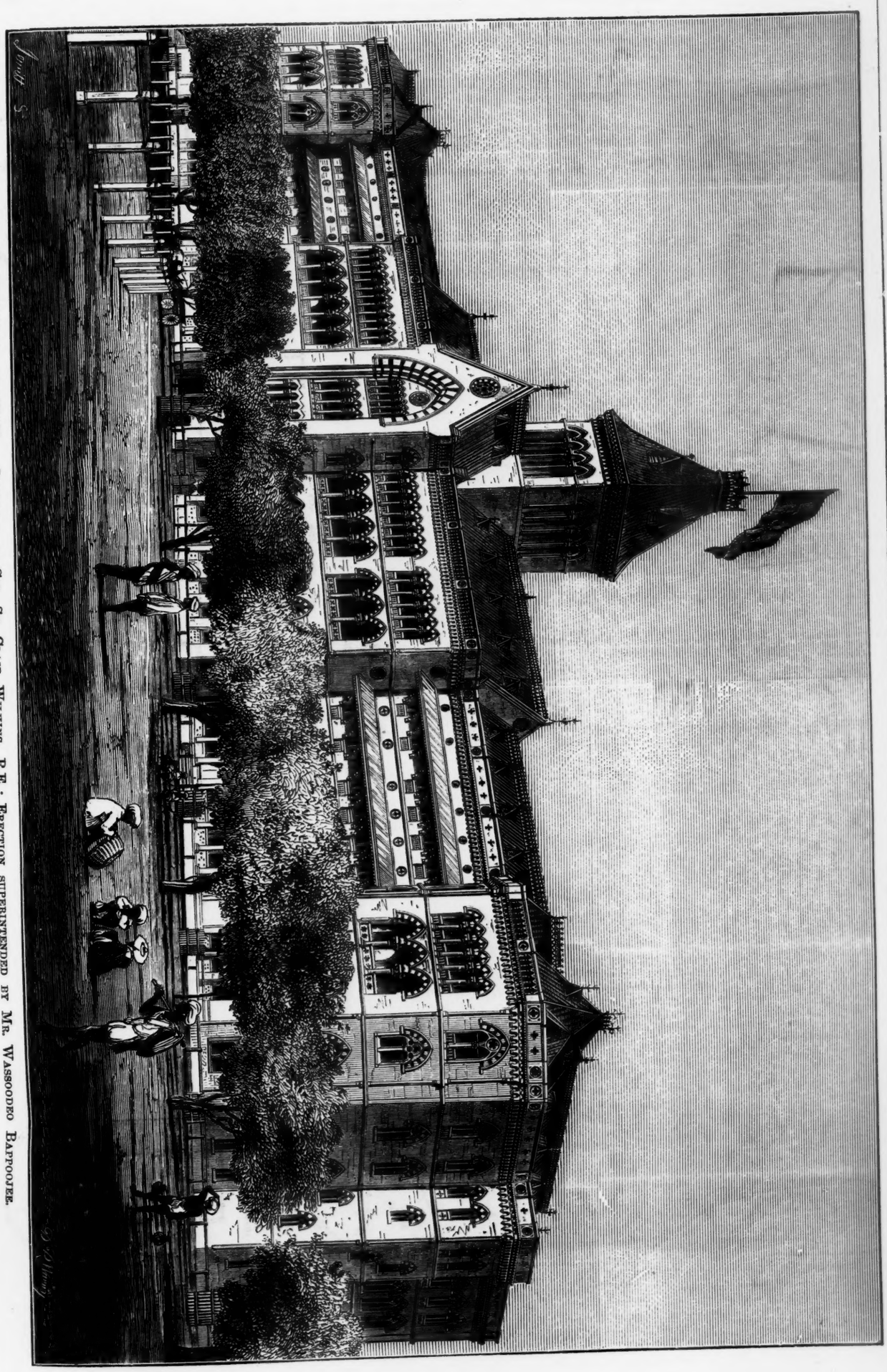


References to Ground Floor Plan.

1. Carriage porch.
2. Main staircase.
3. Accountant-General's office.
4. Treasury-room.
5. Collector of Bombay and Superintendent of Stamps and Stationery.
6. Government Secretariat records.

References to First Floor Plan.

1. Accountant-General.
2. Ante-room.
3. Council-hall.
4. Committee and luncheon room.
5. Library and Members of Council.
6. His Excellency the Governor.
7. Collector of Bombay.



NEW SECRETARIAT, BOMBAY.—Designed by Col. St. Clair Wilkins, R.E.: Erection superintended by Mr. Wassoodeo Bappoojee.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.

The opening meeting of the Session 1875–6 held be held on Thursday, the 25th inst., when the president, Mr. Thomas Drew, R.H.A., will deliver the inaugural address.

General meetings will be held each month during the session. The classes of Design and Construction (which heretofore met on alternate Thursdays) will now meet on the same evenings twice a month, the business of one class to be taken up after the other.

The following is a list of papers to be read at the ordinary general meetings:—

Nov. 25.—President's Address.
Dec. 30.—Working Drawings. By J. J. O'Callaghan.
Jan. 27, 1876.—Hints from American Practice. By W. Fogerty.
Feb. 24.—Paper by Sandham Symes.
March 30.—Earth-closet System. By J. H. Owen.
April 27.—Two Cathedrals: Canterbury and Amiens. By C. H. Brien.
May 25.—Paper by F. Morley.

The prizes for last session have been awarded as follows:—The prize in Class of Design, to W. J. Fennell. For best set of measured drawings of any building in the United Kingdom up to the eighteenth century, to Benjamin P. Shires, Leeds. For the best design for a town church, to J. H. Martindale, Kendal.

The officers for this session are:—

President.—Thomas Drew, R.H.A., F.R.I.B.A. Vice-President.—Wm. M. Mitchell, F.R.I.A.I. Committee.—C. J. Allen, Henry C. Brett, Daniel J. Freeman, G. C. Henderson, Thos. H. Longfield, J. J. O'Callaghan, W. P. O'Neill, A.W. Robinson, John L. Robinson. Treasurer.—T. H. Longfield. Librarian.—C. J. Allen. Auditors.—H. Oldham, J. C. Wilmot. Hon. Secretaries.—Henry C. Brett, A. W. Robinson.

HIGHEST SHAFTS.

In reply to your correspondent, "C. L.," the highest chimney-shaft that I know of in England is on the Kay-street Machine Works at Bolton, in Lancashire. The proprietors, Messrs. Dobson & Barlow, have kindly given me the following information respecting it:—

The large chimney-stack connected with seven boilers, ventilating flues, furnaces, &c., at these works was completed in November, 1842.

Total height from ground level, 367 ft. 6 in. Octagonal on plan, 14 ft. on every side, or 112 ft. in girth, at bottom; 5 ft. 6 in. on every side, or 44 ft. girth, at top. Thickness of brickwork at bottom, 8 ft.; thickness of brickwork at top, 1 ft. 6 in. 800,000 bricks and 120 tons of stonework were used.

The top, with cornice and mouldings, required 30 tons of stone and cement.

R. M. Bancroft.

Sir,—I believe the highest shaft in the world is at Port Dundas, Glasgow, and was built by Mr. R. Corbett, of Duke-street, Glasgow, for Mr. J. Townsend, Crawford-street Chemical Works.

The total height from foundation to top of coping is 468 ft., and from ground line to summit, 454 ft.; the outside diameter at foundation being 50 ft., and at ground surface 32 ft., and at top of coping, 12 ft. 8 in. The number of bricks is as follows:—

Common bricks in shaft	1,142,532
Composition and fire bricks for inside cone	157,468
Common bricks for flues	100,000
Total number of bricks	1,400,000

Weight of bricks about 5,000 tons.

E. C. T.

BLOTS AT THE GREAT EASTERN STATION, LIVERPOOL-STREET.

Sir,—I am not an architect, and have very little reason to write on architectural subjects, but I have, along with a hearty contempt for those who pretend to be architects and muddle and spend money, a most sincere respect and admiration for masters of the craft—for the skill which enables a man to prepare his designs, and sit down and draw a modern contract with every detail thought out before the work begins,—and when I see a great work lacking this foresight and skill, and find, as appearances would lead one to infer, that no architect has been employed,—only an engineer,—I cannot forbear bringing it under the notice of one who, like you, is charged with the public duty of rebuking great defects in building, as much as of encouraging merit.

The building to which I am now referring is the Great Eastern Station, Liverpool-street, and I send you a note of some of the defects there which have struck me.

1. The northernmost approach is by a wide carriage-way which, about half way between the street and the station is suddenly contracted, the path jutting out into the road. Some night there will be an accident with a cab coming in hastily.

2. In the north wall there are two openings with double iron gates. These gates are each 5 in., together 10 in.,—too narrow for the opening, so that when shut there is to each an opening of 5 in., apparently for a dog to jump through between the pier and the gate. Further, when open and thrown back flat against the wall on either side, the heels of the gates project into the opening 5 in. on each side, to the detriment of hasty or incautious passengers, or ladies with full skirts.

3. The sides of the station have roofs running in bays, from the columns that sustain the central roof to the outer walls; and they have an opening at the top for ventilation, various ribs being used. When you stand in the centre of any one bay the two iron angles and the centre of the curve all range true to the eye; but if you look sideways to the other, right and left, or do not stand just in the centre of any one, the confusion is exactly what an architect would have foreseen and provided against, and what a civil engineer does not see even when the work is finished. Pleased with lines sketched on paper for one bay, he evidently just ordered repeats without considering how his lines would look viewed obliquely.

4. When laying out his station, he must have forgotten the urinals, otherwise he surely would not have placed them obtrusively at the foot of each staircase leading to the trains, and of conspicuous, rather fantastic, brickwork, the doors opening right upon the ladies as they go down to the trains.

No doubt the station will answer its purpose very well, but it would have answered equally well if the forethought of a skilled architect had been used; and I very much question whether all his fees would not have been saved by the forethought which would have obviated the frequent alterations that have put one in mind of old Horace,—

"Diruit, ædificat, mutat quadrata rotundis."

If what one sees at this station is indicative of what one does not see in the management of the company, no wonder the shares are at a discount.

Common Sense.

THE PROPOSED CHANNEL AND SUBMARINE TUBULAR BRIDGE.

With reference to connecting England and France by railway communication, Mr. Peter W. Barlow, F.R.S., the author of the Tower Subway project, in connexion with which he has made a long tunnel under the Thames from Tower-hill to Horselydown without letting in, as expected, a drop of the water of the Thames, now puts forward a modification of the suggestion originally made by Mr. John de la Haye for a tubular communication, which in its modified form becomes a submarine tubular bridge. Mr. Barlow believes tunnelling under the sea to be a mistake. The submerged tube has the advantage over all the tunnelling projects that the construction of fifty or more sections of the tube can be going on simultaneously, whilst but two pairs of men could work at the same time in the tunnel; and it is this, Mr. Barlow thinks, that renders the completion of the tube within a year possible.

The plan proposed is to make the tube of elastic iron, or steel plates riveted together, surrounded and protected by 2 ft. 3 in. of brickwork (which, as the required deflection is but ½ in. in 100 ft. could be conveniently used) laid in asphalte, and beyond this by 6-in. timber planking, well caulked and secured by rings of copper, or by a copper cylinder. Such a tube, he remarks, would float in the water, and would require some further loading to cause it to sink and lie on the bottom. Thus, it might be constructed at shipbuilders' yards in lengths of about 300 ft., and towed to the proposed line of railway. These lengths may be joined together by a floating iron cofferdam or dry dock. The whole tunnel may be laid in a few weeks when the requisite lengths are complete, and the time required to execute a double tunnel from France to England will depend upon the rate at which the steel and other materials can be supplied; and Mr. Barlow is informed that such a supply of steel and other materials can be obtained, with Continental assistance, in one year. He has, therefore, assumed one year as the time necessary to complete this work. He points out that the tunnel, being constructed of steel, is so elastic that the portion completed may be loaded and laid on the bottom of the sea while the upper part is being fitted together on the surface of the sea, but it is not necessary that it should be laid on the bottom of the sea, as it may be suspended and anchored out of reach of shipping at 25 ft. below the water, in which case the deflection of the tube will be a matter of still less difficulty.

Writing to us on the subject, Mr. Barlow says:—"As the author of the Tower Subway, where I have made a tunnel under the Thames within 15 ft. of the river, without, as expected, letting in a quart of water, I hope you will consider these suggestions worthy of investigation. I have no patent or company, and it is only in the cause of science I ask your attention. I believe that tunnelling under the bed of the sea is a mistake. A tube will be much more convenient to the public when made, because the entrances of a tunnel must be some miles inland. It is safer to execute, and much more rapidly executed. It will have better gradients and higher speed. There is less length of tunnel, and the cost will be greatly reduced."

We are unable to convince ourselves of the practicability of the scheme.

CHRIST CHURCH, DOUGLAS.

This church, which was consecrated on the 26th ult. by the Bishop of Manchester, is the munificent gift of Miss Morris, of Fairhurst Hall, the cost being about 7,600*l*. The plan consists of a nave, with aisle separated therefrom by four pointed arches supported on granite shafts, with stone caps and bases. The caps are beautifully carved with natural and conventional foliage. The chancel, organ-chamber, and vestry, are on the north side, and the spire on the east side. The lower portion of the tower is set apart for the children's gallery and the entrance to the belfry. There are three entrances to the church, the main one being through a large projecting porch at the south-west end of the nave, one at the side of the tower, to the children's gallery and chancel; the other between the vestry and organ-chamber on the north side. The whole of the aisles are flagged with polished Bradford flags, and the chancel laid with encaustic tiles of ornamental patterns, by Ludwig Oppenheimer, of Manchester. The large chancel inner arch is supported on four small marble columns having the caps and bases richly carved. Accommodation is provided for 420 adults in open benches in the nave, constructed of pitch pine, of somewhat novel design, and most convenient in arrangement. The choir stalls, for twenty-four, in the chancel, are moulded, panelled, and carved.

All the roofs are open-timbered, boarded diagonally, strongly arranged, and are of pitch pine. The chancel has a "wagon" roof, divided into panels. Prominent stands a graceful tower and spire, 115 ft. high to the top of the vane at the south-east corner of the nave. In it is provided a belfry for six bells, with bell-ringers' room under.

The dimensions of the church are,—nave, 57 ft. long by 28 ft. wide, and 42 ft. high to the top of the ridge; chancel, 29 ft. by 20 ft.; organ-chamber, 16 ft. by 12 ft.; vestry, 12 ft. by 10 ft.; tower and spire, used as a children's gallery, 12 ft. by 10 ft. The nave is lighted at the west end by three lancet windows, with a large Catherine-wheel window over; the south side by two two-light and one three-light windows; the north aisle by two three-light and two two-light windows, the upper portions of which are all filled in with tracery.

The whole of the inside is lined with stone ashlar from Ormskirk and Peansbrick quarries. The exterior is built entirely of coursed stone, obtained from Parbold and Longridge quarries. The whole of the windows are filled in with cathedral glass of light green tint. The site is the gift of the late Sir T. G. F. Hesketh, bart., M.P., and commands a most extensive and beautiful view of the Fylde district.

The style of the building is Early English, and takes the place of the old Douglas Chapel, erected over 300 years ago.

The architect for the church is Mr. T. H. Myres (Myres, Veevers, & Myres), of Preston; Mr. J. Pownall, of Preston, acted as clerk of works; Mr. J. Preston, of Wigan, being the builder.

OXFORD AND ITS WATER SUPPLY.

Professor Prestwich delivered a lecture in the Museum, Oxford, on the 25th ult., "On the Geological Conditions affecting the Water Supply to Houses and Towns, with special reference to the Modes of Supplying Oxford." Professor Prestwich prefaced his lecture with the statement that the subject of his remarks on the present occasion was purely practical. It was one of those practical applications of the wide-ranging science of geology which brought them in relation with the engineer and the physician, as some branches brought them in relation with the miner and the architect, while others brought them in relation with the biologist and physicist and anthropologist. However practical it might be in one aspect,—one which it were well if more generally understood,—the principle of the underground distribution of water was in its other bearings not less essential to the theoretical geologist. He had been prompted to make that subject the text of a special lecture with respect to Oxford, in consequence of the question more than once addressed to him, the interest of which required a carefully-considered answer, viz.,—Whether geology could not indicate a source of water supply for the city free of those risks of organic contamination to which a surface supply is too often liable. The subject was one which bore upon the health and comfort of every town and village in the kingdom, and, therefore, he should, as far as the limited time would allow, more especially show its bearings to Oxford. The Professor, although especially referring to Oxford, treated his subject in a sufficiently general manner to apply to any other locality where the strata was not of sedimentary origin such as prevails over the greater part of Great Britain. The Professor having sketched the aspects under which the water-supply of Oxford presented itself, wound up his address by saying that the importance of a large and good supply of water could not be overrated. This as a general proposition was now fully understood, and in all our large and populous towns able engineers had constructed works to secure such supplies, and to do away with the abuses that were inevitable, where, as formerly, each house was the centre of its own water-supply and drainage. But although the flagrant sources of contamination were generally removed from large towns, they still too often lurked in hidden or forgotten corners, while in hundreds of smaller towns and villages, and in thousands of country houses, the plague spot still remained in almost all its foulness and intensity. The air might be pure, the country might be smiling, the water might be bright, the people might be cleanly, ease and luxury might prevail on the surface, but below the surface a poison was, by a delicacy which was not unnatural, hidden out of sight, unknown to most, often kept in subjection for years, or working so insidiously as to raise no suspicion. But there it was, ready when the opportunity offered to fix on the prey and to spread disease and death around. The blow, in fact, was so covertly given that neither the sufferer nor his friends suspected from whence it came. They unavoidably attracted attention, but it was a question with him whether the sum of minor resultant evils did not outbalance the more prominent cases. Against those many risks it seemed nobody's business to guard.

THE VENTILATION OF MINES.

At the annual meeting of the Institution of Mechanical Engineers, held at Manchester on the 5th inst., Mr. W. P. Marshall read a paper on mechanical ventilators for mines, in which he said that in a paper on mining machinery read before the Institution sixteen years ago, by the late Mr. T. J. Taylor, the ventilation of mines by furnaces placed at the bottom of upcast shafts, as compared with the mechanical appliances then in use, was for valid reasons considered the best and safest method. But, notwithstanding its admitted simplicity, the rarefaction of the outgoing air by heat to produce the ventilating current had proved troublesome, expensive, and dangerous. Under these circumstances it was not surprising that, since the subject of mechanical ventilation was last brought before the Institution six years ago, the adoption of the greatly improved mechanical appliances then described for the ventilation of mines should have been so extensive, that in this country there at present were about 250 mechanical ventilators in actual use or in course of construction. In the matter of fuel consumption, the best existing appliances would be about on an equality with furnaces when the latter were employed at a depth of about 700 yards, and the less the depth the greater did the economy of the machine become; but it might certainly be asserted that the furnace ought never to be employed excepting in small mines, where the duration of working and physical conditions were such as not to justify the additional outlay required for a fan. Most, if not all, of the mechanical ventilators at present in use exhaust from the top of the upcast shaft in the case of pits, or at the end of the return air-course, where they were employed for day working. He submitted a statement of the results of experiments on some of the different systems for the mechanical ventilation of mines, and in conclusion called attention to the fact that, in the majority of ventilators now working, low pressures, very little expansion, and consequently wasteful types of engines, were usually employed, where, owing to the almost constant work, a more economical type of engine might be advantageously adopted.

SCOTIA MUSIC HALL, GLASGOW.

The Scotia Music-hall, one of the largest and most popular places of amusement in Glasgow, was, it will be remembered, destroyed by fire in May, 1874, a portion of the outer walls only escaping the violence of the flames. The work of rebuilding is now all but complete, and the hall will soon be re-opened for performance. The work of reconstruction has been carried out from designs by Mr. Sellars (Campbell Douglas, & Sellars), architect, of Glasgow, the contractor for the mason's work being Mr. Adam. The total cost of rebuilding, including fittings, is estimated at 15,000*l*. The new hall will accommodate between 4,000 and 5,000 persons. The large hall proper has been altered from its former oblong shape, and is now semicircular. The dimensions are 120 ft. in length, 78 ft. broad, and 60 ft. in height from pit-floor to ceiling. The stage fittings and arrangements are far superior to those usually found in music-halls, even of the better class, the sum of about 1,000*l*. being estimated for this department alone. The stage is 76 ft. wide and 35 ft. in length, with a cellar sinking to a depth of 15 ft. The proscenium opening is 30 ft. by 27 ft. There are two sets of flies, and extensive carpenters' shops over the ceiling of the hall. All the most approved modern appliances have been made available in connexion with the stage, and commodious suites of dressing-rooms for the artistes are close at hand. The system of ventilation adopted is that of Mr. Potts, of Manchester, which has been fitted at a cost of 300*l*.

PICTURES AND THEIR SURROUNDINGS.

The writer of the sensible article under this heading in the *Builder* of October 30th deserves the thanks of painters for directing their attention to matters of more importance than they may at first sight appear.

The proper relation of the frame to the picture was better understood in the last century than at present. The demand for easel pictures succeeded the grand epoch of mural painting, and instead of a picture now being a part of a series, framed by the architecture, it has become an isolated and independent work, to be considered only for itself. Of late there has been a growing tendency to mix up frame and picture, to introduce ornaments into the frame which have some reference to the subject matter of the painting. This has found favour outside the pre-Raffaellite circle; but it would appear to be a mistake. The frame, when it fulfils its proper function, as a boundary or opening through which the subject is supposed to be seen, should isolate the painting, and not be mixed up with and an integral part of it. A Rubens is better seen when the mouldings of the frame are massive and straight; whereas a picture with meagre forms and contours, or of architecture, will look better in a frame in which there is more of scroll ornament. Another very important consideration is the width which should be given to a frame in proportion to the superficies of the picture. A fine picture may be very materially injured by being placed in too narrow a frame, or in a too broad and flat one.

There are several references in the "Revised Theory of Light" to the lighting of pictures, and there is not one picture in a thousand which gets properly lighted after it has left the studio. A picture is only properly seen in the light for which it was painted. The relative value of all its tones is changed in either a higher or a lower light; for if four gradations are intended to be, in the light for which the picture was painted, as 1 : 2 : 3 : 4, then if we either add or subtract the same quantity of light from each, their proportional relations are changed. If we add 1 to each, the gradation becomes 2 : 3 : 4 : 5; if we subtract one from each term, the gradation is changed to 0 : 1 : 2 : 3. The relation in the first instance of 1 : 2 thus becomes either 2 : 3, or 0 : 1. If picture-collectors were to show any judgment in collecting and arranging their pictures, it would be, in some degree, a return to a better state of things,—a state of things somewhat approaching the ancient decorative adjustment of mural pictures. But in most collections there will, probably, not be two pictures which have been painted in the same kind of light. Landscape-painters make a great mistake if they paint their pictures in the open daylight, when they are afterwards to be hung in low lights, and often wonder what makes their pictures, when hung, look so different. When painters will listen to science, they have much to learn about lighting their models and their pictures.

In one point I have to differ from your article. A picture should doubtless be a fine thought, a "brain thought," as the writer has it. But, unfortunately, easel painting does not keep your painter so close to thinking as mural painting. A large proportion of easel pictures are, therefore, merely *pièces d'occasion*, "bits," with very little evidence of thought.

W. C. T.

GRAPES AS AN ORNAMENT.

Sir,—I have read the reply of "Senex," who says, "that grapes are used as ornaments because in the Holy Scriptures the grape and the vine have unusual prominence."

It is my humble opinion that "the model tradesman" who made my bracket had the Holy Scriptures very little in his mind at the time he gave his directions to his workmen. The model and the mould were before him, and always at hand, and therefore cheaper and less troublesome than any new invention, and more easy for a workman whose art-education ends with being able to execute a bunch of grapes.

It has been so for generations. The indifference of the public has not stimulated a change from, and the laziness of the executant has prevented him getting out of, the groove of grapes.

I have stayed at a house of which, Mr. Editor, you furnished the design. The caps and other parts there are ornamented with copies of the ferns that grow on the estate. Here you were very wrong. Ferns are not mentioned in Scripture; you should therefore have used grapes, which you might have found already carved and moulded, and, doubtless, much cheaper than any new object; but then there would have been no room for gracefulness of fancy on your part, or for skill or feeling on the part of the artisan.

Thistles are mentioned in Holy Scripture; but, then, none but a Scotsman is alive to their æsthetic beauty. "Senex" adds,—"as also in being in their form and growth, in fruit and foliage, one of the most graceful and elegant of Nature's works." I admit the "one," but I cannot admit that this should ride over the illimitable objects in Nature that are graceful and elegant. If "Senex" has a doubt about the beauty of other forms, I would suggest that he should pay a visit to Kew Gardens; and, as a favour, I would ask that he should read the article on "Religious Art," in the present number of the *British Quarterly Review*.

F. S. A.

STATE OF ST. LEONARD'S PRIORY, STAMFORD.

On a casual visit to Stamford recently, I observed with regret indications that the interesting Priory of St. Leonard, near that town, will soon be in ruins if some remonstance, more powerful than mine, be not raised against the neglect which is causing its decay.

The west front, which with its cluster of detached shafts and its ornamental mouldings gives me the impression of Early Norman work altered in the twelfth century, is apparently sound; but the north face of the building has, within the last few months, become seriously impaired: two large portions of the ashlar have yielded to the weather, and exposed the inner

part of the wall. I fancy a few pounds expended now would preserve it: some months hence a few hundreds would not restore it.

Those who live on the spot are apt to disregard their own treasures of antiquity, and no one seems to care much about this building.

You will do a service to archæology if you can promote the restoration of the damage, or the preservation of the building from further decay; and if the owner objects to expense, and will accept a subscription, I will show my interest by giving, through you, 1*l.* towards it. B. S.

BARNSTAPLE.

The new Bridge Hall is, after much delay, at length being finished. The carving, which is being executed by Mr. Harry Hems, of Exeter, and his assistants, from the designs of Messrs. Gould & Sons, architects, Barnstaple, is somewhat extensive, embracing, on the exterior, the ornament of the capitals upon the upper story of the façade facing Bridge-street,—as well as the corbels underneath. The central tympanum of the higher story will have the Bridge Arms cut upon it, and these will be supported by heraldic mantelling upon diapered ground. The segmental corner of the building,—picturesque as it is in its tower and grouping from every point of view,—has had the busts of King Edward II., the famous Bishop Stapleton, good old Major Penrose, in the costume of the time, and a baron of the period, cut upon the cornice in bold relief.

The new Fish-market is nearly completed. Messrs. Gould & Son are the architects, and the octagonal plan which they have adopted is said to give good promise.

THE WARMING OF WORKMEN'S DWELLINGS.

Without doubt fuel is capable of being greatly economised for warming purposes, if the present system of open fireplaces be abandoned, especially in the large blocks of dwellings for the industrial classes which are now becoming prominent features in London and most of our large towns; and the increasingly high price of coal will of necessity tend to reconcile the poorer classes to the loss of that appearance of homeliness and cheerfulness which the open grate presents, if the warmth which is so vital a necessity can be provided cheaply and without injury to health by other means. Mr. F. Eiloart, of Chancery-lane, offers a suggestion to architects and others whose duty it will be to deal with the plans of the new buildings erected under the Artisans' Dwellings Act. He says,—"Having for some years had the management of the property of the Society for Improving the Dwellings of the Industrious Classes, presided over by the Earl of Shaftesbury, I had constant opportunities of observing the great difficulties the labouring classes had to contend with in keeping their rooms clean, and I found that the chief difficulty arose from the necessity of their having to store their coals and fuel in their dwelling-rooms, and in the subsequent disposal of the refuse from the grate. Now, I wish to suggest that the grate should be entirely abolished, and that the new buildings should be warmed throughout upon some such principle as that employed in most large factories, mills, printing-offices, &c., and I feel sure that practical architects would find no difficulty in applying that system, and in designing some method by which the fire to be used for heating the apparatus would not only furnish a constant supply of hot water for the tenants, but could be made available under proper regulations for cooking purposes. The saving of fuel to each individual tenant would more than compensate them for any slight addition it might be found necessary to make to the rent for the purpose of defraying the expense of the arrangement, the rooms would always be warm, clean, and comfortable, and a great element of danger from so many open fire-places would be removed."

The Centennial Exhibition, Philadelphia. An American paper says that the buildings designed for the use of the Commission of Great Britain are located north-west of Machinery Hall, a short distance from George's-hill. There are two structures, both of which exteriorly are nearly finished, while the interior work is being pushed forward with all possible despatch. It is said that no building upon the ground will be so well appointed.

HEALTH AND SEWAGE OF TOWNS.

The Council of the Society of Arts have resolved to appoint a standing Committee for the purpose of collecting facts and holding a conference yearly, at which the experience gained and the progress made in the past year will be reported and discussed, such Conferences to be continued as long as necessary.

Corporations and Local Boards of Health are invited to communicate with the secretary, and forward to him any suggestions they may think proper.

BELFAST ARCHITECTURAL ASSOCIATION.

At the opening meeting of the session, Mr. William R. Jackson presided, and there was a large audience, which included a good many ladies.

Mr. Robert M. Young read a list of prizes offered.

The committee have arranged the following subjects for the evening class of design:—First evening, font; second evening, design for bank in small country town, plans and elevations; third evening, completion of same by sections and details; fourth evening, hall chimney-piece; fifth evening, open-timbered roof for an octagonal apse, 25 ft. span; sixth evening, newel and balustrade; seventh evening, competition for Mr. Lynn's prize, subject to be announced.

The chairman said it was most gratifying that the Association, in its fourth year, was in such a flourishing condition. During three years of its existence which had passed it had been favoured with a large amount of success. The Association had a bright future before it. The members saw the style of the architecture of Belfast and the North of Ireland improving year after year.

Mr. Hevey, architect, read a paper on "Church Architecture." He said the subject was one in which every member of the community necessarily felt an interest, the best and truest proof of which was afforded by the number of new churches erected by the several denominations which they had seen springing up around them. As the subject of church building has been treated of from almost every point of view by as many distinguished professors of the art, his better course would be to touch lightly on some cognate matters, and to take a few features which might be locally recognisable, and some of which he should venture to criticise, even at the great risk of being criticised himself. The first thing they must recognise in church building was the importance of the substantial character of the fabric, for, unfortunately, many people had seen the church they helped to build, and around which their most hallowed recollections were centred, gone to utter wreck and ruin before they themselves have gone to that "bourne whence no travellers return," and certainly this must needs excite melancholy reflections and feelings of indignation against the unfortunate architect whose no doubt well-meant efforts were the primary cause of such a dire result. It was only necessary to refer to such a deplorable state of things as having been, and to express a hope that it would not occur again. Another aspect of this question was that churches which did not come under the foregoing observations had generally, through the advancement of art education, been depreciated in public esteem, so as to render them considered as unworthy of being preserved. Like people who have lived sufficiently long to be out of fashion. Their existence is tolerated for the reason that it cannot be helped. Architects were every day becoming more and more familiar with the peculiarities of church architecture, and to consider the practice of it as something more than a mere method of obtaining an existence; and the general public have at length discovered that, after all, there is something in church building to be considered more than the mere security and substantiality of the fabric—something due to that glorious inheritance of art which has been transmitted to us, and which it is the duty of the architect to preserve and foster so far as in him lies. While they were striving to foster and develop that idea in the public mind, some of them committed many vagaries, especially in matters of detail, for generally it will be found that those who are not perfectly up in Gothic and kindred styles of art, and who are simply copyists, reduced to the necessity of taking a door from here and a window from there, do not and cannot know how to harmonise and assimilate their borrowed or stolen materials; and the result was a visible discrepancy in all portions of the building. They could see in Belfast churches of various kinds where the front is adorned by doors and windows over, and otherwise decorated with buttresses, carving, &c., while the remainder of the building, flanks and rear, although exposed to view, is plain, even to positive rudeness. With some the system seemed to be to spend on the front every available shilling beyond what is absolutely required for the mere construction of the work. The sooner this state of things was altered the better.

DRAINAGE OF MAIDSTONE.

Sir,—In reply to Mr. Angell's letter on this subject in your issue of the 6th inst., permit me to say that I did *not*, in my letter to the Maidstone corporation, claim the invention of the drainage plans accepted from Mr. Angell. What I did was to point out to them that, by the scheme they were about to carry out, they were practically adopting the same plan of outfall sewer and sewage disposal as I proposed in 1867, notwithstanding that the sewer might be on the opposite side of the river, and other modifications made in the details of construction; and this is admitted in Mr. Angell's letter, for he states "the only point in common being the outfall below Allington Lock, a point that, without any engineering knowledge, is obvious to any one." This may be; but if there is any engineering knowledge at all required, it is in the construction of the outfall-sewer to the tidal water below Allington Lock.

There may not have been any invention in selecting the point of outfall; but if there was any, it was no more patent to any one in the case of Maidstone than it would be in the case of many other towns.

My plan was abandoned in favour of one recommended by Mr. B. Latham; and if the proposition to construct the outfall sewer along the side of the Medway, to discharge the sewage below Allington Lock had not been revived, I should not have written the Maidstone Board on the subject; but inasmuch as what I then recommended (whatever the defects may have been) is about to be carried out in principle, I thought it was the proper time to point out to the Board that it would only be fair to make me some allowance for the extra work I had in connexion with my own plan, as well as for the assistance rendered to other engineers who had been consulted on the subject.

This is a matter really between me and the Maidstone Local Board, and I am sorry that either Mr. Angell or myself should have had occasion to have addressed you in the matter.

Judging from the very valuable assistance Mr. Angell has given to municipal engineers and surveyors in connexion with their association, I feel sure he would be glad (as he states) to hear that I had been compensated for work done. Edward Buckham.

Town-hall, Ipswich.

BUILDING BYE-LAWS.

DEPOSIT OF NOTICE AND PLANS.

At the Bromley Petty Sessions, held on the 1st inst., Mr. Benjamin Jones, a local builder, was summoned at the instance of the Local Board for the district of Bromley, in the county of Kent, for an infringement of the 29th bye-law of the said Board, the defendant having commenced to build a house without having first deposited at the office of the Board's surveyor such notice, plans, and sections, as is and are required by the said bye-law to be deposited. Defendant pleaded not guilty.

Mr. Hugh S. Cregeen, surveyor, proved that the defendant had wilfully refused to deposit the requisite plans, although little progress had lately been made with the building. Owing to the latter fact, the justices took a lenient view of the case, and convicted the defendant of the offence against the bye-laws, and ordered him to pay the mitigated penalty of 3*l.* and costs.

[N.B. The decision in the above case is consistent with the ruling of the Court of Queen's Bench on the 20th of January last, in the appeal case of Hall *v.* Nixon, 39 J.P., page 69.]

THE TEMPLE GARDENS FLOWER SHOW.

Sir,—It may, perhaps, be a matter of interest to some of the number of visitors to the chrysanthemum show in the gardens of the Inner Temple, who are not already aware of the fact, to know that there stands in them the trunk of an old sycamore, or yew tree (I forget which), that is of ancient date. Tradition tells us that under the shade of this tree Dr. Samuel Johnson, as well as his attached friend, Oliver Goldsmith, not unfrequently sat. It is close to the spot where formerly stood the old City wall, and the site is, I think, introduced in one of the acts of Shakspeare's play of "King Henry IV." The visitor to the Temple Gardens may easily find out this old tree trunk. It stands on the left-hand side of the lawn of the Inner Temple Garden, looking towards the Thames and the Embankment. It has an iron fence round it, with a good many supports, being in a very broken condition. I have on a former occasion remarked that it seems a pity that there is no notice-board fixed to the tree, calling the attention of passers-by to this interesting relic of bygone days.

The autumnal floral beauty (the chrysanthemum) is very fine this year, both in the gardens of the Inner and Middle Temple, and will well repay a visit.

Nathaniel Wetherall.

The New Mint.—It is now rumoured that the Government has decided to build the new Mint on the vacant ground lying between the Savoy and the Adelphi-terrace, belonging to the Duchy of Lancaster and the Metropolitan Board of Works.

IS AN ARCHITECT A JEWELLER?

SIR,—Is an architect a jeweller? O happy thought! Yes! Or, at least, that is what he should be, but which, unfortunately, is precisely what he is not. Painting and sculpture are the jewels which the architect should be taught to set. But falling, as the architect has, upon evil times, when painting and sculpture are not appreciated as the jewels, the gems, of civilisation, architecture, except in the shape of penthouses to protect us from the weather, has no *raison d'être*. There is something about the architect of the present day which would appear to confirm the Platonic doctrine of "reminiscence," for he appears to have some dim adumbration of what has been, and that he ought properly to be the setter of something; he, therefore, sets nothingness with tawdry. Not having the higher arts to assist him, to help him to something new, he is content with the time-honoured dolphin, the festoon, and the scroll as ornaments, and to do his little best after *a* fashion of things that have gone before.

Our friend in Nova Scotia seems to think that our architects have become Michelangelos and Raffaelles, and that they are now able to design frescoes and glass windows. Bless his innocent heart! Whatever our architects may have accomplished in this way is as yet unknown to fame. Nevertheless, it is just possible that they may have been restrained from exhibiting what they may have accomplished in this way by being straight-jacketed by their friends.

Our Nova Scotian has, I fear, hit upon his most happy analogy by a fluke; for does he not know that Angelo and Raffaelle were able both to design and execute frescoes, and yet that they were not, on this account, in the least incapacitated from designing architectural works which, by far, eclipse the best attempts of the present day? BRISTLE.

ASSAULT ON A DISTRICT SURVEYOR'S CLERK.

AT the Hammersmith Police Court, Richard Whaler, a sculptor, of Shepherd's-bush, has been brought before Mr. Ingham, on a charge of violently assaulting Mr. Wm. Holditch Stevens, managing clerk to Mr. Knightley, district surveyor of Hammersmith, by beating him about the head with a mallet. It was alleged that the prisoner was annoyed at the action taken by the district surveyor and his clerk with respect to some wooden buildings belonging to the prisoner.

Mr. Charles W. Chapman, a surgeon, of Goldhawk-road, proved that the injured man would not be able to attend for another week.

Mr. Waring hoped the magistrate would grant bail.

Mr. Kisch, who prosecuted, objected, and read an anonymous letter which Mr. Knightley had received through the post, telling him to be careful, as he would be a corpse, and that he ought to be poleaxed and dipped in tar. He (Mr. Kisch) believed it was in the prisoner's handwriting.

Mr. Ingham said it was a most serious assault, and he should refuse bail.

The prisoner was then remanded for eight days.

SCHOOL BOARD SCHOOLS.

Grimsby.—At a meeting of the Grimsby School Board, on the 28th ult., ten tenders for the erection of the new school were opened, but all being found much above the estimate of the architect, Mr. C. Bell, London, it was agreed to defer the consideration of the offers to a future meeting.

Troqueer.—At a recent meeting of the Troqueer School Board, held in the Court House, Maxwelltown, Mr. Barbour submitted plans for the erection of a new school near Maxwelltown parish church. The plans provide for 300 pupils, and allow ten superficial feet for each child. The estimated cost is 2,200*l.* The plans were approved.

Loftus-in-Cleveland. — On the 27th ult., memorial stones of new schools at Carlton and Robin Hood were laid, under the auspices of the Loftus-in-Cleveland School Board. The schools are identical in design, being Gothic in style, and constructed of brick with stone dressings, and having open roofs. They are designed to accommodate 250 children each, having a boys' and girls' mixed school and class-room, and infants' school and master's house. The area covered by the premises is about 2,600 yards in each case; the total cost, with land, being estimated at 6,500*l.* The architect is Mr. William Watson, of Wakefield. The contractors for Carlton School are,—brick and stone work, Chapman & Son; joiners, J. Gill & Son; slating, E. J. Rawling; plastering, W. Walsh & Son; plumbing and ironwork, Mr. Brook; painting, C. Barker. The contractors for Robin Hood School are,—brick and stone, Illingworth & Verity; joiner, W. Calam; slating, Pycock & Son; plastering, Walsh & Son; plumbing and ironwork, Mr. Brook; painting, C. Barker.

SCHOOL-BUILDING NEWS.

Hartley Wintney.—The plans and specifications of the proposed school and masters' house, Hartley Witney, prepared for the vicar and churchwardens by Mr. Harry Pool, of Hartley Wintney, have been approved by the Education Department.

Battersea.—The Green-lane Parochial Schools, High-street, Battersea, were re-opened on the 19th ult., after enlargement. The additions include a large room, 100 ft. by 24 ft., built over the old schools, with cloak-rooms and lavatories; also two large class-rooms on the ground floor. The works have been carried out under the superintendence of Mr. Wm. White, F.S.A., at a cost of about 2,000*l.*, by Mr. Thomas Gregory, of Station Works, Clapham Junction. Mr. W. H. Williams was clerk of works.

Upholland. — The foundation-stone of new National Schools at Upholland was laid on the 23rd ult. The buildings are intended to accommodate 120 children, and will comprise a mixed school for boys and girls, with a large class-room attached; an infants' school-room; with cloak-room, lavatory, and entrance-porch for the girls and infants, and a separate cap-room, lavatory, and entrance-porch for the boys. The style will be Gothic, and the material local rubble stone, faced with shoddies, and relieved with red stone bands and dressings. Large playgrounds, with the necessary outbuildings, will be provided. The cost will be about 3,000*l.* Mr. Peter Balmer is the architect, and Mr. Templeman, of Upholland, is the builder.

DISSENTING CHURCH-BUILDING NEWS.

Otley.—A new Wesleyan Chapel in Boroughgate, Otley, was opened on the 13th ult. The building, which will seat 1,000 persons, is in the Italian style, and has been erected from a design by Mr. E. Taylor, architect, York. The gallery extends on all sides around the pulpit, and is semicircular at the ends. The tie-beams of the roof are visible, and form moulded panels at the sides, with pendants at the intersections; the centre of the ceiling is arched, and forms a raised vault the full length of the chapel. The woodwork is of red and yellow pine, stained and varnished. The heating is by Grundy's hot-air apparatus. The building is built of stone which has been brought from Messrs. Whitaker's quarries at Horsforth. The contractors for the works are:—For the brick and stonework, Messrs. Whitaker & Sons, Horsforth; for the joiner's work, Mr. Henry Creaser, of York; for the plasterer's work, Messrs. Chaffer, Otley; for the plumbing, glazing, and gasfitting, Messrs. Suttle & Waddington, Otley; for the painter's work, Mr. E. Bennett, Otley; for the smith's work, Messrs. Exley & Son, Otley; and for the slater's work, Mr. Joseph Thornton, Eccleshill. The cost of the building, inclusive of the site, is about 6,800*l.*

Middlesbrough.—Trinity Presbyterian Church, Middlesbrough, was opened on the 13th ult. The new church consists of a nave and aisles, transepts and apse, the apse being separated from the nave by a boldly-moulded arch in Caen stone, springing from carved corbels of the same material. Communicating with the church are a minister's vestry, session-house, and lecture-room. The style adopted is Early Decorated. The seats are open benches, with sloping backs and moulded ends. The windows are glazed with cathedral-tinted glass set in leadwork. The church will at present seat about 550 people, which number can be increased to 700 by the addition of side galleries. The heating is effected by means of apparatus supplied by Haden & Son. The total cost has been about 3,700*l.* The architects are Messrs. Ross & Lamb, Darlington.——On the 5th ult. the foundation-stone of a new United Methodist Free Church was laid at Middlesbrough. Mr. E. Potts, of Oldham, is the architect of the structure which will be in the Classic style, and built of bricks, the front being faced with pressed bricks, and relieved with stone dressings. The chapel will afford accommodation on the ground floor for 530 adults. Galleries will run round three sides of the edifice, capable of seating 470 more, making the total sitting accommodation sufficient for 1,000 persons. The schools at the rear of the chapel will be sufficient for 350 scholars. The total cost of site, chapel, and schools, with boundary walls and other expenses, is estimated at 7,800*l.*

Winsford.—Foundation-stones of a new United Methodist Free Church at Winsford, Cheshire, were laid on the 5th ult. The total cost of the new building will be about 2,000*l.* The brickwork and joinery have been entrusted to Mr. James Fowles, and the masonry to Mr. Fletcher.

Matching.—A Congregational chapel was opened a few days ago at Matching Tye, Essex. It will seat 120 persons. Mr. George Perry, of Bishop Stortford, was the architect; and Mr. Burton, of Sawbridgeworth, was the builder.

Hammersmith.—A new Wesleyan Methodist chapel has just been erected at the junction of the Hammersmith and River-court-roads. It consists of nave, aisles, and transepts, and is in the Decorated Gothic style, the principal material used being Kentish rag, with Bath-stone dressings. Sittings are provided on the ground floor for 650 persons, and for 410 in the galleries, making a total of 1,060. Messrs. Adamson & Sons, of Turnham-green, were the general contractors. The heating apparatus has been supplied by Mr. Grundy; the gas-fittings are by Messrs. Brawn & Downing; the chancel decorations were executed by Mr. Cox, of Southampton-row; and the stained windows by Mr. Jackson, Hammersmith.

Chattisham.—A new Wesleyan chapel was opened at Chattisham on the 14th ult. It will accommodate about 200 persons. The contract for the work was taken by Mr. James Welham, of Hintlesham, at 450*l.* The architects were Messrs. Cattermole & Eade, Ipswich.

Wickford.—A new Congregational chapel at Wickford, Essex, was opened on the 19th ult. Mr. Charles Pertwee, of Chelmsford, is the architect.

Rockley.—A new Wesleyan chapel at Rockley, near Retford, was opened on the 8th ult. The structure has been designed and erected by Mr. Theophilus Wilson, East Markham, at a cost of about 300*l.*

Greig.—A new Primitive Methodist chapel was opened at Greig, near Grosmont, on the 10th ult. Mr. T. Davies, of Hereford, is the architect, and Mr. J. Price was the general contractor.

Halifax.—The foundation-stone of a Methodist New Connexion Chapel in Queen's-road, Halifax, was laid on the 2nd ult. Mr. William Hills, of Leeds, is the architect, and the various works required in the erection of the structure have been let to the following firms, viz.:—Mason's and excavating work, Mr. Henry Jenkinson; joiner's work, Mr. Anthony Sutcliffe; plumbing work, Messrs. Akroyd & Mills; slater's work, Messrs. Wm. Pycock & Son, Leeds; plaster work, Mr. John Franks, Leeds; and painter's work, Mr. Joseph Dell.

Little Horton.—A new Congregational Chapel at Little Horton, near Bradford, was opened on the 17th ult. The chapel, beneath which are schoolrooms, is 72 ft. by 32 ft., with a north aisle 46 ft. by 13 ft. It is seated with open benches of red deal, stained and varnished, and will accommodate 440 persons. The roof is open-timbered, ceiled at the level of the collar-beam, and the spandrels are enriched with pierced woodwork. Externally the tower at the north-west angle is the most prominent feature. It is 60 ft. in height, and is built of freestone. The front towards Thornton-lane is also built of freestone, and has a cornice with a pediment over the centre portion. The style is Italian. The whole of the rooms are warmed by hot air, from an apparatus by Messrs. Taylor & Parsons. The contractors for the building are:—Messrs. F. Barraclough & Son, masons; John Moulson & Son, joiners; W. H. Hargreaves, plasterer; Sutcliffe & Wilkinson, plumbers and glaziers; James Smithies, slater; and Boyes & Dawson, painters. The building has been erected from the designs of Messrs. T. H. & F. Healey, architects.

Newcastle-on-Tyne.—The new Danish Lutheran Church of St. Johanne, Maple-street, Newcastle-on-Tyne, was consecrated on the 19th ult. The site is a commanding one at the corner of Maple-street and Waverley-terrace. The church, which

is built of stone, consists of a nave and short chancel, with a tower at the north-east corner, surmounted by a lantern and a slated spire. The style is Early English. The contracts for building have been carried out by Mr. Walter Scott, for mason's work; Mr. Jas. Miller for joiner's work; Mr. Place, of Shields, for slating; Mr. Wallace, for plastering; Mr. Manderson, for plumbing; Messrs. J. & G. Laidler, for painting and glazing; and Mr. Falconer, for ironfounder's work. The architect is Mr. F. R. N. Haswell, of North Shields. Mr. Welford acted as clerk of the works.

Ipswich.—The memorial-stone of a new Baptist Chapel at Ipswich was laid by Sir Morton Peto on the 21st ult. The new building, which will replace the old Burlington Chapel, will occupy a site fronting the London-road, and will cost about 5,000*l.*, the accommodation to be provided being for 1,000 persons. Mr. Brightwen Binyon is the architect, the contractors being Messrs. E. & E. C. Gibbons.

Kilmuir Easter.—The foundation-stone of a new Free Church in the parish of Kilmuir Easter, Inverness, was laid on the 27th ult. The old church, which had become unsafe, has been pulled down. Messrs. Munro, Alness, are contractors for the mason work.

Banff.—Messrs. Ellis & Wilson, architects, Aberdeen, have submitted plans for the enlargement of the Free Church, Banff; 108 additional sittings are to be provided, at a cost of 1,200*l.*

Sketty.—The first stone of a new Wesleyan Chapel at Sketty was laid on the 21st ult. by Mr. H. H. Vivian, M.P. The style of the chapel will be Gothic, the architect being Mr. Joseph Totton, of Swansea, and the builder, Mr. J. Gwyn, Sketty.

Bromley.—The foundation-stone of a new Wesleyan Chapel was laid at Bromley (Kent), on the 19th ult. The style is Early English, and the material used is Kentish rag, with facings of Bath stone. The architect is Mr. W. W. Pocock. The building is to be erected at a cost of 3,180*l.*, by Mr. W. A. Grubb, of Bromley, and will accommodate 600 persons.

Worksop.—The foundation-stone of a new Congregational Church and Schools has been laid at Worksop. The building is in the Early Gothic style, the church being divided into a nave and aisles by stone columns and arches. The cost will be about 3,000*l.* The architect is Mr. Tait, of Leicester, and the contractors Messrs. Redfern & Son, of Worksop.

Great Malvern.—The foundation-stone of a new Congregational Church at Great Malvern has been laid. It is planned to seat 500 persons, and is in the Middle Pointed style of architecture. The cost will be 4,500*l.* The architect is Mr. Tait, of Leicester, and the builder Mr. Meredith, of Gloucester.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

West Cornforth.—A new Roman Catholic Church, dedicated to St. Patrick, was opened on the 18th ult., at West Cornforth, near Ferry-hill. The north gable abuts on the high road, and, rising to a height of 70 ft. from the ground, is the gilded stone cross on the apex of the bell-turret. A porch or narthex, near the width of the edifice, occupies the lower portion of the north façade. Divided from the church by a moulded arch, 32 ft. high, is the large apsidal sanctuary, and adjoining are the sacristy and presbytery for the priests. The walls of the church are boarded to the height of 5 ft., and the seats consist of open benches of pitch pine. The length of the church is 100 ft. by 36 ft. wide. The style adopted is Thirteenth-century Gothic. The whole has been designed and superintended by Mr. Richard Robinson, architect, Darlington, and carried out by the following contractors:—Joiner's work, Messrs. Bridges & Robson, of Hartlepool; slating, Mr. Atkinson, of Darlington; plumber's work, Mr. Lishman, of Darlington; brick and stone work, Mr. H. Hogarth, West Cornforth; and plaster work, Mr. Macnamara, West Cornforth.

Oxford.—The new Roman Catholic church, which has been built by the Jesuit Order at Oxford, is to be consecrated on the 23rd inst. The new church stands about 40 ft. back from the Woodstock-road, and is designed in the simplest and severest style of Early English architecture. It consists of a nave with shallow side-aisles, and a dwarf chancel. It is about 130 ft. in length, and from 35 ft. to 40 ft. broad. It is lofty, with an open wooden roof, and is lighted by a series of large windows in the clearstory. There are two side-chapels. The church is to be dedicated to St. Aloysius, and its architect is Mr. Charles Hanson.

Brighton.—The Roman Catholic church of St. John the Baptist, Bristol-road, Brighton, was reopened on the 31st ult., after considerable alteration and extension. The extension of the church has been effected by lengthening it 60 ft. northward, so that it has now a total length of 116 ft., and will seat about 500 worshippers on the floor space. The alterations have been carried out from designs by Mr. Gilbert Robert Blount, of London; the clerk of the works being Mr. J. T. Carew. The builders were Messrs. Patching & Webber, of Portland-street, the contract sum amounting to about 2,000*l.*, the fittings involving an expenditure of some 500*l.* in addition.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, held on Monday evening last, at 9, Conduit-street, Sir G. G. Scott, president, in the chair, the decease of the following members was announced:—D. A. Cobbett and H. H. Vale (Fellows), and J. H. Stevens (Associate). Several donations of books, &c., for the library were announced, and the following new members were elected:—Mr. Lloyd Taylor, of Melbourne, Australia, and Mr. William Pain, of 3, Whitehall, as Fellows; and Mr. E. H. Horne, of 47, Old Broad-street, as Associate.

The Secretary called attention to some specimens of Mexican onyx marble, which were exhibited. One peculiarity of the material was that, owing to its laminated structure, it could be split into very thin slabs. Mr. McVicar Anderson remarked that it was a very beautiful material, and one capable of being used for interior decoration with very great effect. Being a new material, however, he could not speak as to its durability.

Mr. Boulnois then proceeded to read a short description of the building proposed to be erected for the "Exposition Universal" at Madrid, from designs furnished by M. Colibert, a pupil of M. Viollet-le-Duc. The building was specially designed with the view of ultimately costing the Spanish Government nothing for its erection. The building consists on plan of a vast parallelogram, terminating at one in a hemicycle, and occupying an area of nearly 400,000 superficial feet. The extent of the building could be increased indefinitely by prolonging the hemicycle. The interior consisted of five parallel galleries of different dimensions. Each of these parallel strips would be allotted to different countries, the same classes of objects exhibited by each country being brought together for comparison by a transverse arrangement. The materials of the building would be cast and wrought iron, roofed partly with glass, and partly with the light tiles of the country. Each compartment of the building would be insulated in its construction, one or more of such compartments being suitable for railway stations, covered markets, rotundas, locomotive sheds, &c.,—buildings which were at present very much wanted in Spain. When the Exhibition terminated, these compartments would be taken down and sold, the purchase-money recouping the Government for the cost of erection.

Mr. Edward Hall remarked that the arrangement proposed for the exhibits was not new; it was substantially the same as that which had been tried in the Paris Exhibition of 1867, and which, in his opinion, was a conspicuous failure.

Mr. Boulnois replied that the method of arrangement was only a collateral advantage of the building he had described, and for this no merit was claimed; it was the method of building so that the structure might be entirely utilised for other purposes when the exhibition was concluded which was claimed as worthy of attention.

Mr. R. Popplewell Pullan then read a paper "On the Decoration of Basilicas and Byzantine Churches," of which we give the substance on a previous page.

In the discussion which fol'owed,—

Mr. C. T. Newton, of the British Museum, said there was a mosque at Constantinople which was not generally known to have been a Byzantine church; it was very near to the building sometimes called the Palace of Belisarius. It was full of mossics, not quite covered with whitewash, and was well worth a visit, even at the risk of incurring the displeasure of the populace. Mr. Pullan had alluded to the facing of coarser materials with a finer material such as stucco. It might not, perhaps, be generally known that the ancients adopted this practice very largely and very successfully. In the course of his investigations at Halicarnassus he had come across specimens of the ancient stucco, which was made of fine white marble, pounded, and painted on the surface. He had picked specimens of it out of the watercourses of the street with the ancient patterns in colour still upon them; and he believed there was no doubt that Rhodes, which was so celebrated for its symmetry, was built with coarse stone faced with white stucco. He had also, in the course of his investigations, discovered many imitations of marble, somewhat resembling scagliola. In the Græco-Roman basement of the British Museum (which, he was sorry to say, was very little better than a cellar), there was a large collection of pavements taken up at Carthage and Halicarnassus. They were probably of about the third century of the Christian era in date, and, though rude in drawing, yet as specimens of combination of colour they were not unworthy of attention.

Mr. Cockerell said that the use of stucco as a decorative material in ancient times, was not confined to the East; it was to be seen in Italy, as in the columns of the Temple of Vesta at Tivoli. There was also a very remarkable specimen in Sicily at Girgenti. It consisted of a small temple, which was probably pulled down by the iconoclasts, and remained in ruins until about thirty years ago, when a German artist got permission to put some of the columns up again, after being thrown down for perhaps 1,800 years. The stucco on the columns remained so perfect that when the columns were pieced together the joints were scarcely visible, and there was a fine polish on the surface.

Mr. Phené Spiers suggested that probably the chief reason for employing stucco on the temples of Sicily was that the stone of the locality did not permit of fine mouldings being obtained, as in the temples of Greece.

Sir Gilbert Scott said the same thing was to be seen in Rome in the temple of Fortuna Virilis, but it was doubtful whether these were examples to be imitated.

Mr. William White, F.S.A., in proposing a vote of thanks to Mr. Pullan for his paper, said that the principle of using positive colours, relieved by black and white, was a most valuable one to the colourist, and one that ought to be more generally followed than at present. Mr. Pullan had spoken disparagingly of red and buff brick for interior church walls, but such materials, it should be remembered, afforded a very good groundwork for decoration, especially in this country, where there had been so many disastrous failures with every description of plaster.

Mr. Penrose, in seconding the vote of thanks, said he was glad to hear that it was the feeling of the last speaker that the brickwork so often seen in our churches should be intended only as a groundwork for decoration, although some of it, he was afraid, never would be decorated, and seemed as if it was never intended to be decorated.

Mr. Boulnois described Mr. Pullan's church at Baveno as being very successful in its treatment. On the subject of stucco, he remembered a discussion in the rooms of the Institute between Mr. Benjamin Ferrey and Mr. Talbot Bury as to how far the stucco had originally extended in the ancient church of Little Maplestead.

Mr. Crace having said a few words,

Sir Gilbert Scott, in putting the motion, which was afterwards carried, said he corroborated Mr. Pullan's remarks as to the extreme beauty and interest of the decorated buildings he had described. As to the use of stucco, he thought that it was only to be objected to when it was treated in the speculating builder's manner; he did not think any one was such a purist as to object to stucco in the abstract. That stucco was anciently used there was ample evidence. Some years ago he was making a survey of the churches on the Duke of Newcastle's estate in Nottinghamshire, and he found invariably that the earliest parts of the church had stucco, or traces of stucco, upon them. As to the use of veneers or slabs of marble, they were perfectly legitimate, so long as they were placed vertically, and not made to look as if they were solid blocks.

BUILDERS' BENEVOLENT INSTITUTION.

The twenty-eighth anniversary festival in aid of the funds of this Institution took place on Thursday, 11th inst., at Willis's Rooms, St. James's, Mr. John Aird, jun., president of the Institution, in the chair, supported by Colonel Beresford, M.P., Mr. George Plucknett (Cubitt & Co.), Mr. Charles Lucas, Mr. Thomas Lucas, and other friends of the Institution to the number of about 280. The usual loyal and patriotic toasts having been duly honoured,

The Chairman, in proposing the toast of the evening, "The Builders' Benevolent Institution," remarked that the object which they were met to promote was one worthy of the utmost support of all who were connected with building and the associated trades. The Institution was certainly entitled to greater support than it received. There were at the present time forty-three pensioners on the funds of the Institution, twenty-three women and twenty men, the men receiving 24*l.*, and the women 20*l.* per annum. Many of the pensioners were once prosperous, if not affluent, but such were the vicissitudes and risks of the building trade that they had become reduced in circumstances. He could vouch for it, from personal acquaintance, that the Institution was most economically and judiciously managed, and no candidates' names were submitted to the subscribers until the cases were thoroughly sifted and inquired into. There were at the present time five applicants for admission on the funds of the Institution, but he regretted to say that with the present resources of the charity there were only vacancies for two. In conclusion, the Chairman alluded, in terms of deep regret, to the great loss which had been sustained by the death, a short time ago, of Mr. Cozens, the founder of the Institution. Mr. Cozens was a most benevolent man, the founding of the Institution being only one of his many philanthropic labours. The Institution had sustained another great loss by the death of Mr. Harris, who for so many years had been the active and zealous secretary to the Institution. This was a loss which, for a time at any rate, seemed to be well-nigh irreparable, and the Institution could not be sufficiently grateful to Mr. Thomas Stirling for the disinterested manner in which he had acted as secretary *pro tem.* since the death of Mr. Harris. Now that they had elected a new secretary in the person of Major Brutton, they might soon hope to be going on smoothly again. It was greatly to be regretted that the workmen engaged in the building trades did not devote their spare capital and energy to the establishment and maintenance of similar societies for themselves: their money would be far more profitably invested than in promoting strikes.

The toast was received enthusiastically.

Mr. Charles Lucas next proposed "The Chairman and President," alluding to him as "Honest John Aird," the name by which he was familiar to all who knew him best. Mr. Lucas also alluded to the decease of Mr. Cozens and Mr. Harris, and expressed his sense of Mr. Stirling's great services to the Institution. He considered, however, that the Institution was very inadequately supported. Considering the vastness of the industries connected with building, a single firm sometimes employing as many as 10,000 men, it was not creditable that they should have, election after election, to send away two or three applicants for 20*l.* a year.

The chairman having replied, Mr. Dines proposed "The Vice-Presidents and Trustees," coupled with the name of Mr. J. Russell Freeman, who briefly responded.

Mr. Thomas Lucas next proposed "The Treasurer" (Mr. Geo. Plucknett), who, in reply, said that the Institution had, at the time he was speaking, funded property to the amount of 18,400*l.*, and he hoped that when the subscriptions had been announced there would be upwards of 19,000*l.* It was greatly to be desired that they should not have to turn away eligible and deserving candidates for the bounty of the Institution, and it was no less desirable that the amount of the pensions awarded should be slightly increased.

Several long lists of subscriptions were next read, including 52*l.* 10*s.* by Messrs. John Aird & Sons, 52*l.* 10*s.* by Sir John Kelk, and 50*l.* by Messrs. Clayton & Shuttleworth, the total amount subscribed being 869*l.* 5*s.* 6*d.*, the chairman's list alone amounting to 491*l.* 9*s.* The total amount subscribed was unusually large.

Mr. Rogers proposed "The Architects and Surveyors," coupled with the name of Mr. Arding, who briefly responded; and Mr. J. M. Macey proposed "The Directors and Stewards," coupled with the name of Mr. Wilfrid Nicholson, who, in responding, proposed a special vote of thanks to Mr. Thomas Stirling for his services to the Institution. Mr. Stirling acknowledged the compliment.

Mr. Charles Lucas said that with the amount just subscribed the Institution had now funded property to the extent of 19,300*l.* He should very much like to see it made up to 20,000*l.* at once, and therefore he, on behalf of his firm, would volunteer to be good for 100*l.* towards the 700*l.* required, if six other gentlemen would give 100*l.* each.

Mr. Plucknett said that his firm (Cubitt & Co.) would promise another 100*l.*

There were no further responses to Mr. Lucas's suggestion, but it was stated that efforts would be made to get the remaining 500*l.* within the next few weeks.

ANOTHER DIFFICULTY AT HASTINGS.

The question of building a new town-hall at Hastings has not yet passed out of the stage of public discussion. The blundering of the past year has just reached further development. A few days ago the town council received tenders for the erection of public offices in accordance with plans selected out of two competitions. Two sites had been chosen: the last on a swamp, with 40 ft. depth of soft wet clay-mud above the rock. Instead of the foundations costing 2,000*l.*, as allowed by the council, the lowest tender for that portion of the work is 4,480*l.*, and increasing in amount up to 7,000*l.* The idea of putting such a sum out of sight, in concrete, has aroused a feeling in favour of purchasing a large piece of ground in a more eligible position, and now occupied by the Castle Hotel and its adjuncts. The proposal having been received very warmly, at a recent public dinner a requisition was got up, and after obtaining a number of influential signatures, was presented to the mayor. His worship immediately called a town meeting, which was both largely and influentially attended. A motion in favour of the Castle Hotel site was met by an amendment, approving of the selection made by the council. This was negatived by a majority of about 250, and the original motion was carried with cheers. During the meeting it was stated that the lowest tender for the superstructure was a little over 19,000*l.*, the council having allotted 18,000*l.* for that purpose. It was also stated that the lowest tender, taking building and foundation jointly, was 26,780*l.* There were seven tenders sent in, but the figures have not been made known,—except to a chosen few,—because the building committee have asked the council to give further time for consideration of the report.

A BIG THING IN TRADE-BOOKS.

Securely packed in a deal box, comes to us from the other side of the wide Atlantic, certainly the most extravagant trade-book we have ever seen. It is issued by Messrs. Mallory, Wheeler, & Co., of New Haven, Connecticut, and illustrates on about 300 pp. of fine thick paper, royal folio, the door locks, knobs, padlocks, and other fastenings manufactured by them, in exact *fac simile*, and full size. The iron, steel, nickel, brass, copper, bell-metal, lacquered and japanned work, silver plate and porcelain, that enter into the combination of locks, handles, and escutcheons, are set forth in their proper colours. Each kind of polished metal is represented by a different coloured bronze. The management of this bronze work is excellent, and the extent to which it is employed may be inferred from the fact that more than twenty pounds of pure silver bronze, costing 50 dols. per pound, have been used on the book. We are told that the printing of the book occupied three of R. Hoe & Co.'s new stop-cylinder presses for about one year. There were 2,000 copies printed, and we understand that the value of the work, completed, is about 80,000 dols.; or 8*l.* each copy. To make the book American throughout, the leather used for binding is made from Yankee cowhide. The firm has been established forty years, and Messrs. Mallory claim that brass and wrought and malleable iron are mostly used in the interior construction of their locks. Common cast iron is in no case relied upon, except where the part is so heavy that there is no possibility of failure. The keys mostly fold in two. The prices are not filled in, so that we are unable to judge how they stand in that respect as compared with English manufactures. The book before us can scarcely fail to make Messrs. Mallory, Wheeler, & Co. talked about, and that, we apprehend, is one of the main objects they have in view.

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Sir,—A question having been raised in more than one of the professional journals respecting the course adopted by the secretary of this Institute in reference to the publication of our president's opening address on the 1st inst., I am requested to inform you that the Council, before whom the matter has been laid, having heard the secretary's explanation on the subject referred to, express their entire concurrence with the course taken by him in carrying out the instructions contained in the following resolution passed by the Council on the 22nd January, 1872:—

"Resolved,—That for the future the rules as to the copyright of Sessional Papers, laid down in Bye-law 45, Section XI., be maintained, and that it be left to the secretary to arrange how and when abstracts from such papers shall be furnished to the professional journals."

The Council request me to furnish you with a copy of this resolution, to prevent any further misunderstanding on the subject.

Fred. P. Cockerell, Hon. Sec.

THE TIMBER TRADE.

The official returns from the Board of Trade of the importations of timber at the principal ports of the United Kingdom during the years 1874 and 1873 have just been issued. One point worthy of notice is the vast trade of London in comparison with other emporiums of the timber traffic.

The stream of prosperity which set in towards the fall of 1872 seems to have attained its highest level in the autumn of 1873. It is true the imports of the following year rose still higher, just as when a river overflows its banks on a high spring tide it continues to deluge the land for some time after the ebb has begun. The surplus and breakwater of the previous year, represented by an unusual number of floating cargoes detained abroad, completely bore down all opposition when they came upon the market in the following spring; and prices gave way in all directions, carrying with them many a bulwark and buttress in the trade, which had been previously believed capable of bearing any amount of strain that was likely to be put upon them.

ENGLAND.

	Hewn Timber.		Sawn or Split Timber.		Total Imports of Timber.	
	1874.	1873.	1874.	1873.	1874.	1873.
	Loads.	Loads.	Loads.	Loads.	Loads.	Loads.
London...	317,778	229,332	1,043 909	953.589	1,361,687	1,182,921
Liverpool .	269,345	206,407	462,660	472,948	732,005	679,355
Hull	107,181	123,697	389,923	291.221	497,104	414,918
Newcastle .	106,499	99,602	111,879	104 580	218,378	204,182
Grimsby ..	97,461	100,564	157,071	111,945	254,532	212.509
Hartlepool.	168,433	161,770	213,324	171,792	381,757	333,562
SCOTLAND.						
Leith	22,674	14,315	71,876	60.756	94,550	75,068
Greenock..	138,925	74.400	41.725	25,005	180,650	99,405
Dundee ..	29,212	23,567	39,250	32,588	68,462	56,155
Grange-mouth ..	69,238	59,771	99,564	111,643	168,802	171,414
IRELAND.						
Dublin	17,653	24,985	49,474	56,972	67,127	81,957
Belfast	23,447	14,609	54,130	41,534	77,577	56,143

TOTAL FOR THE UNITED KINGDOM.

	1874.	1873.
Hewn timber (loads).....	2,446,525	2,077,982
Sawn or split timber (loads) ...	3,841,011	3,434,160
Total	6,287,536	5,512,142

"Payment in Kind" for "Lending a Hand."—The case of Winter *v.* Carter, heard at the Brompton County Court on the 12th inst., before Mr. Serjeant Wheeler, was a claim for 1*l.* 18*s.*, for work done. Plaintiff said he was employed as a plumber for the defendant, who, after he had done the work, refused to pay him, because he said he had been giving the labourers the lead chippings. He admitted that he had given one of the labourers about 2 lb. of lead for "lending him a hand," but that was in the interest of defendant. His Honour observed that that admission put an end to the case. He had disposed of his master's property, and his verdict was for the defendant.

Miscellanea.

The Denbigh Reredos Case.—The awards of Dr. Stephens, Q.C., and Dr. Deane, Q.C., arbitrators respectively for the Bishop of St. Asaph and the Building Committee of Denbigh New Church, in the long-pending reredos dispute, were announced on the 12th inst. Both arbitrators pronounced the reredos illegal. The awards set forth that a cross by itself, or the Saviour's image by itself, is not illegal; but joined together, and if the Saviour is represented as extended upon the Cross, it becomes illegal, because such representation is liable to lead to superstition, and teach pious worshippers to adopt an image. The Denbigh reredos they consider especially open to this objection because at the foot of the cross are women adoring the dying Saviour. The arbitrators, therefore, agree in pronouncing the central compartment of the reredos illegal. The committee will accept this decision, and either remove the whole reredos, which cost 500*l.*, and is richly sculptured, or the central compartment.

"Building" on Rubbish-Shoots at Stoke Newington.—In a recent number of the *Builder* (p. 937) we referred to some houses in course of erection in Defoe-road, Stoke Newington, as likely to prove hotbeds of fever. At the meeting of the Hackney District Board of Works, on the 12th inst., Dr. Tripe, medical officer of health, reported that he had visited the houses in question, and he found that in accordance with his promise the builder was laying down a bed of concrete over the entire area, with a view to preventing injury to the health of the occupiers of the buildings. At the same time he discovered that more dust was being shot into large holes in vacant land in the same thoroughfare, but on the opposite side of the way. He had written to the Metropolitan Board, directing their attention to the fact that fine siftings of house refuse were being mixed with the mortar employed in the construction of buildings in this district, and he had received a reply to the effect that the Board were desirous of preventing the continuance of this objectionable practice.

The Rivers Pollution Commission.—The commissioners appointed in 1868 to inquire into the best means of preventing the pollution of rivers, having concluded their labours, have now published their sixth and final report. The first part explains the mode of investigation which the commissioners have followed in the chemical examination of the various samples of water, and the meaning of the terms used in the analytical tables. The second part relates to the classification and chemical composition of drinking-water. The third part discusses several considerations of special importance in connexion with the wholesomeness of certain kinds of water. The fourth part describes the condition of the water supplied to the metropolis, to a large number of cities, towns, and villages, and rural districts of Great Britain, and to the residences of her Majesty and his Royal Highness the Prince of Wales.

The West Front of Lincoln Minster.—The *Lincoln Gazette* states that the report of Mr. W. H. Barlow, F.R.S., C.E., who was deputed by the Dean and Chapter of Lincoln to report on the actual condition of the west front of the Minster, entirely confirms the view taken by Mr. Pearson, R.A., the Cathedral architect. Mr. Barlow does not agree in the desirability of an attempt to force the western front back into its original vertical position, but represents in the strongest way the importance of putting the great staircase of the south-western tower and the whole of the western front into a better state of security with as little loss of time as circumstances will permit. Neither gentleman considers that the foundations are in the least insecure.

The Drainage of Dublin.—On the 15th inst., in the Vice-Chancellor's Court, counsel for the Solicitor-General, at the instance of John M'Evoy and John M'Inglis, applied for an injunction to restrain the Lord Mayor and Corporation of Dublin from making an application to Parliament for a Bill for extending the borrowing powers and continuing the compulsory provision of the Dublin Main Drainage Act. The solicitor for the Corporation applied for an adjournment, and the opposing counsel consented, on condition that the defendants should not incur any further expenses in relation to the Bill pending the adjournment.

The Ramsgate Surveyorship.—No fewer than sixty-five candidates have applied for the appointment (rendered vacant by the resignation of Mr. Ellice-Clark, who has been appointed town surveyor of Derby) of surveyor to the Ramsgate Local Board of Health. The committee appointed to investigate the testimonials reduced the number, first of all to thirteen, and then, by the exhaustive system of voting, to the following six:—A. W. Conquest, Clapham; G. W. Dixon, Beccles, Suffolk; B. M. Hiscocks, Wandsworth; R. H. Inch, Croydon; C. McCallum, Dover; and A. W. Mulling, Manchester. This number was reduced to four by the Board at its meeting on the 9th inst., viz., Messrs. Conquest, Hiscocks, Inch, and McCallum.

School Board Offices.—Sir Andrew Fairbairn, chairman of the Leeds School Board, recently had an interview with Sir F. R. Sandford, secretary to the Education Department, with the view of ascertaining how far the Government would be disposed to assist in carrying a Bill for obtaining the powers which the Leeds and other Boards are anxious to have in providing permanent offices. The secretary said their lordships would not wish to stand in the way of the Leeds Board being in a position to move in the matter by a private Bill, if it should be thought advisable to give notice of one. The Board has resolved to introduce a private Bill in the coming session.

The Studio of the late J. Birnie Philip. We have pleasure in mentioning that Mrs. J. B. Philip has arranged to carry on the studio of her late husband, Mr. John Birnie Philip, under the management of Signor Fucigna, for many years Mr. J. B. Philip's chief assistant modeller. Sir Gilbert Scott, Mr. W. Calder Marshall, and Mr. John R. Clayton, having inspected several original models executed by Signor Fucigna, comprising colossal heads, a sketch for a bas-relief for the reredos of Lightcliffe Church, Halifax, and a classical figure, have testified as to his ability as a sculptor, and to complete the commissions left unfinished by the late Mr. J. Birnie Philip at the time of his death.

Chimney Construction.—Lord Shaftesbury's recent appeal on behalf of climbing boys has already borne fruit. A master builder was summoned before the Huddersfield magistrates, a few days since, for not having built a chimney in accordance with the 6th section of the Act of 1840. It was contended for defendant that there was no penalty attached to the offence, but only a forfeiture; and further that the public Acts had been overridden by the Local Act. However, the builder was formally convicted, but a case was granted for the Supreme Court.

Dunfermline Water Supply.—Messrs. J. & A. Leslie, civil engineers, of Edinburgh, were recently instructed by the Town Council of Dunfermline to make surveys with the view of ascertaining the best source of water supply for the town. They have now submitted a report in which they express their decided opinion that the only adequate source of supply is the district of Glendevon. To obtain a supply of one million gallons per day from Glendevon to Craigluscar they propose at present to construct a reservoir in Glenquey, capable of holding 21,000,000 cubic feet of water. The cost is estimated at 42,650*l.*

Industrial Dwellings.—It is stated that the Government have agreed to lease the Improved Industrial Dwellings Company a large site adjoining the Chelsea Barracks, at Pimlico. Among other sites recently acquired by this company is one containing more than an acre of land, between Upper-street and Liverpool-road, Islington, which has been purchased from the North London Railway, and will enable the company to supply a want greatly felt in that neighbourhood.

Paisley Abbey Church.—Prince Leopold, after visiting the ancient abbey of Paisley, called attention to the fact that the building contains no monument to Robert II. and the other members of the Stuart family who are buried in the abbey, and it has been stated that the Queen on being informed of this, has graciously signified her willingness to erect a suitable memorial.

Royal Engineer Masons and Bricklayers for Gibraltar.—Two detachments of masons and bricklayers have been selected from the 1st and second companies of Royal Engineers at Shorncliffe, to proceed with the detachments of Royal Engineers leaving the School of Military Engineering, Brompton, on the 29th inst., for Gibraltar and Malta.

Castleford and Whitwood Drainage.—At a meeting of the joint Boards of Castleford and Whitwood, held on the 10th inst., Messrs. M. Paterson, of Dewsbury, and Wm. Wheaten, of Leeds, were appointed engineers to carry out the combined drainage scheme for the two districts, and also to prepare the plans, &c., necessary in the application for provisional orders for the compulsory purchase of lands and easements connected therewith. The Castleford Local Board are also about to apply for a great extension of their district.

Alleged Nuisance from Cement Works in the Isle of Wight.—At a meeting of the Rural Sanitary Authority for the Isle of Wight, held at Newport the other day, an inspector from the Local Government Board attended with reference to a complaint preferred by the Queen, through Sir Thomas Biddulph, as to an alleged nuisance stated to be experienced at Osborne from the smoke of the cement works at Dodner, belonging to Messrs. Francis. The local inspector was ordered to report on the subject at the next meeting of the Authority.

Crystal Palace Company's School of Practical Engineering.—A colonial section has been arranged for, to commence operations on January 5, 1876. This section is designed particularly for gentlemen who intend to proceed to the colonies or abroad, as explorers or settlers. The object proposed is to afford them so much practical knowledge of scientific and mechanical work and expedients, as shall enable them best to utilise the means with which they may have to deal, especially when entirely dependent on their own resources.

New Police Station at Brighton.—The north-west Police and Fire-Escape Station, ordered by the Brighton Town Council to be erected in West Hill-road, and begun in May last, is now completed and fit for occupation. It is in the Italian style, and will be heated by a new process, viz., that of heat generated by gas, and conveyed through pipes, the suggestion of Mr. Philip C. Lockwood, the Borough Surveyor, under whose supervision the building has been erected.

Kew Gardens.—A short time ago a deputation, headed by Sir Henry Peek and other influential gentlemen, waited upon the First Commissioner of Woods and Forests to request him to sanction a new entrance to Kew Gardens by a path across the Old Deer Park. The Lords of the Treasury have just intimated by letter to the Richmond Select Vestry that they must decline to sanction the opening of a footpath across any part of the Old Deer Park.

The Iron and Steel Institute.—It is stated that a supplementary meeting of the Iron and Steel Institute will shortly be held in London to dispose of the papers left over from the Manchester meeting in September. The meeting will be held in the rooms of the Institution of Civil Engineers, Great George-street. There will be an adjourned discussion on several papers, including that by Mr. Snellus, "On Fireclay and other Refractory Materials." Several modifications in the rules will be considered.

The Albert Memorial Chapel.—The First Commissioner of Works notifies that by the permission of the Queen the public will, on and after December 1st, be admitted to view the Albert Memorial Chapel, Windsor, three days a week,—Wednesdays, Thursdays, and Fridays,—from twelve till three o'clock. Admission will be by ticket only, limited in number, which can be obtained at the office of the clerk of the works at Windsor Castle.

A New Bridge in Aberdeenshire.—The contracts for the new bridge across the Ythan, near Waterside of Slains, have now all been entered upon, the following being the contractors:—Bisset & Sons, Aberdeen, for the concrete work and foundations; Abernethy & Co., Aberdeen, for the iron work; and Hugh M'Kay, Fraserburgh, for the earthwork and embankments. Mr. Willet, of Aberdeen, is the engineer. The cost will be about 4,000*l.*

New Public Offices.—An evening paper announces that the Government have directed notices to be given for a Bill to acquire as a site for public offices the ground extending from the new public offices and the India Office to Great George-street and the Park, including Charles-street, King-street, Delahay-street, Duke-street, the remainder of the west side of Parliament-street, and the north side of Great George-street.

A Church destroyed by Fire.—The old and interesting Norman Church at Churcham, situated about five miles from Gloucester, was on the 26th ult. destroyed by fire. The spire, peal of six bells, the roof of the nave, and the pews were burned, but the chancel and its fittings were saved. The fire is supposed to have been caused by the bell-ringers (who were at practice on the previous night) flinging a lighted match carelessly into some sawdust used for spitting. The church was restored in 1868 at a cost of 900*l*.

Value of City Property.—The lease of the site, with the houses 65 and 67, Ludgate-hill, has just been sold by Messrs. E. & H. Lumley. The price paid, added to the capitalised ground-rent, represents 1,316*l*. per foot frontage for the free-hold.

The Broughty Ferry Building Operatives.—At a meeting of the master builders of Broughty Ferry, held on the 5th inst., it was unanimously resolved, on and after Saturday last, to reduce the wages from 9d. per hour to 8½d. per hour for efficient workmen.

New Bank at Watton.—New bank premises at Watton have just been erected for Messrs. Gurney & Co. The work was entrusted to Mr. J. Frost, of Watton, Mr. Boardman, of Norwich, being the architect.

Competition.—The plans of Mr. R. G. Thomas, architect, of Menai Bridge, have been selected, in a limited competition, for a new Welsh Presbyterian Chapel at Seacombe, near Birkenhead.

A Reredos for Bath Abbey.—The *Bath Chronicle* states that, through the munificence of Mrs. Kemble, the Abbey Church is to be provided with a suitable stone reredos. Sir Gilbert Scott has been consulted, and is preparing the design.

Loan Exhibition of Scientific Apparatus, 1876.—During the past week meetings of the sub-committees of the various sections of this exhibition have been held at the South Kensington Museum.

The Worshipful Company of Carpenters have voted the sum of twenty-five guineas for the promotion of technical education in the Artisans' Institute, Castle-street, St. Martin's-lane.

TENDERS

For the erection of shops, Church-street, Liverpool, for Mr. Alderman Bernard Hall. Mr. Cornelius Sherlock, architect. Quantities by Mr. W. J. Wood:—

Tomkinson & Sons	£30,987	0	0
Rome	29,760	0	0
Holme & Nicol	29,438	0	0
Gabbutt	29,250	0	0
Urmson	29,208	0	0
Jones & Sons	28,995	0	0
Haigh & Co. (accepted)	28,296	0	0

For the erection of shop, show-rooms, and residence, at Croydon:—

Ridge & Kingsland (accepted).

For alterations at Copped Hall, near Totteridge. Mr. Sextus Dyball, architect. Quantities by Mr. W. E. Stoner:—

Greenwood & Son	£3,913	0	0
Wall, Brothers	3,886	0	0
Morter	3,823	0	0
Killby	3,771	0	0
Lascelles (accepted)	3,760	0	0

For finishing a shop in Hackney, for Mr. J. R. Palmer. Messrs. Lee & Smith, architects:—

Waldram & Co.	£689	0	0
Heyworth	645	0	0
Forrest	537	0	0

For the conversion of a block of warehouses in Commercial-street, Spitalfields, into a temporary hospital for the Committee of the Metropolitan Free Hospital, Devonshire-square, City:—

Waldram & Co. (accepted).

For alterations and repairs at the Freemasons' Arms Tavern, Downshire-hill, Hampstead. Mr. J. Pennington, architect. Quantities supplied by Mr. H. Tovey:—

Burford	£745	0	0
Cook	579	0	0
Mildwater	573	0	0
Lunn & Roff (accepted)	495	0	0

For the erection of schools for seventy children, for the School Board of Penmynydd, Anglesey. Mr. R. G. Thomas, architect:—

Jones	£590	0	0
Williams	565	0	0
Owens	555	10	0
Humphreys	487	12	0
Pritchard & Jones (accepted)	462	10	0

For erecting a residence, with lodge and stabling, at Brightling, Sussex, for Mr. J. T. Bailey. Mr. Joseph S. Moye, architect:—

Punnett & Sons	£3,797	2	4
Adcock	3,653	0	0
Grover	3,380	0	0

For proposed additions and alterations to Highfield House, Ravensbourne Park, Catford Bridge, for Mr. James Whitehead. Mr. Josiah Houle, architect. Quantities supplied by Mr. Chas. F. Selby:—

Mitchell	£3,650	0	0
Crossley	3,534	0	0
Sewell & Son	3,458	0	0
Burchell	3,236	0	0
Langmead & Way	3,200	0	0
Amer	3,185	0	0

The War Department have accepted the tender of Mr. J. W. Martin, of Manbey Works, Stratford, for painting, &c., internally the Royal Clothing Depôt, Pimlico.

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